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Influenza and Pneumonia
A Symposium Presented before the Massachusetts Association of Boards of Health

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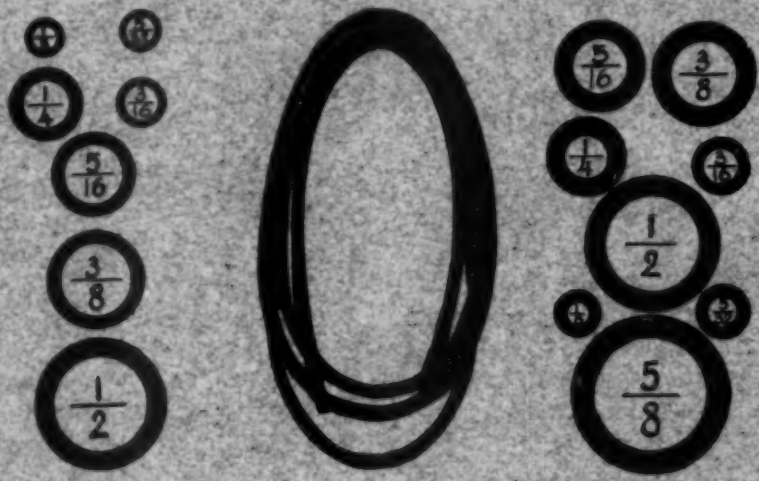

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INFLUENZA AND PNEUMONIA.

A Symposium presented before the Massachusetts Association of Boards of Health, Boston, Mass., January 27, 1916.

This symposium summarizes the opinions of several widely known health workers on the modes of infection, spread, prevalence and nature, epidemiology, and legislative and executive management of influenza and pneumonia—the two diseases which so greatly increased our morbidity rates during the winter season.

DR. M. J. ROSENAU, *Boston:* I have been asked to open this symposium by saying something as to the causes and modes of spread of these diseases. As the hour is late, and I do not wish to take much time from those who are to follow in the discussion and who will consider the epidemiological features and administrative control of these diseases, my part of the program is to play the prelude in order to direct attention to the subject; I will therefore purposely be brief and leave out many things which might be said on the subject of etiology. Furthermore, the exact etiology of these diseases concerns us less than their modes of spread. Take, for example, the case of influenza,—grippe. It makes comparatively little difference to us from the standpoint of preventive medicine, from the standpoint of the health officer, whether this disease is due to the bacillus influenza or whether some of these so-called grippes and grippal colds are really streptococcal infections or due to pneumococci or other microorganisms, or even to a filterable virus, as we have reason to suppose they may be in accordance with the work of Krause of Vienna. If we know how they are spread we may be able to control them. Again it should be clearly kept in mind throughout this discussion that our ignorance is profound not only as to the etiology but much concerning the pathogenesis and epidemiology of these affections.

I think we have a pretty clear idea of how influenza is spread,—by the secretions from the nose and mouth. The virus leaves the body in these secretions and enters likewise through the mouth or through the nostrils of those who receive the infection. In other words, it is a direct contact infection in the vast majority of cases, occasionally contracted indirectly in ways that I prefer to leave until we

have a word about pneumonia, because I think there is a much larger misunderstanding, or perhaps lack of knowledge, concerning pneumonia than almost any other disease or group of diseases in the communicable list. We place pneumonia frankly and fearlessly and clearly, despite our limited knowledge of that disease, with other communicable or contagious diseases. If pneumonia were a new disease, it would be regarded as contagious as diphtheria or tuberculosis, or, frankly, as scarlet fever, and there would be no question but that antiseptic principles would be used; that isolation would be employed, and that other means would be adopted in the administrative control of this disease, just as in other contact diseases.

Pneumonia is a general term, and includes not one disease but a group of diseases. This has been fairly worked out by Dochez and Cole and corroborated by a number of other workers. We have at least four pneumococcal diseases causing croupous or lobar pneumonia.

The first group is due to a pneumococcus, which we call group one of this classification and causes 30 to 47 per cent. of all cases of pneumonia, and has a mortality of about 24 per cent. It is therefore a fatal disease.

In the second group we have another pneumococcus, very closely related to the pneumococcus which causes the first group, but about as different from that pneumococcus as a wolf is from a fox. These two pneumoccoci have distinct biological differences, which can be readily determined in the laboratory. There is no trouble to distinguish one from the other, particularly by certain agglutinations, etc. This group is responsible for from 18 to 39 per cent. of all the cases of pneumonia, and is fatal in about 60 per cent. of the cases caused by it. In other words, the person who gets pneumonia with this particular pneumococcus has a particularly virulent infection, almost as fatal as the pneumonic form of plague.

The third group of pneumonia is due to the pneumococcus mucosus. It has a distinct mucoid capsule and distinct characteristics which we readily recognize in the laboratory by abundant mucous-like stringy growth on surface colonies. This particular pneumococcus is responsible for only 8 to 13 per cent. of all the cases of pneumonia, but is fatal in about 61 per cent. of cases,—again a particularly fatal form of pneumonia.

Then we have the fourth group, which is a heterogeneous group of pneumonias, due to all sorts of microorganisms that do not classify themselves, but they represent only 20 per cent of all cases of pneumonia, and only 7 per cent. of such cases are fatal. That is a "benign" kind of pneumonia, and not very prevalent.

Observe, please, that groups one, two and three are responsible for 80 per cent. of all cases of pneumonia, and furthermore, that these three pneumococci, 1, 2 and 3, are found only in cases of pneumonia, in persons who have recently had pneumonia, and in persons who have recently been directly in contact with a case of pneumonia.

We used to say that it was the easiest thing in the world to find the pneumococcus in the throat of almost anybody. When I was a young student in the laboratory, following Sternberg's classic observation, one of the things that every bacteriologist did was to take some of his own sputum, or some material from his throat, and inject it into a rabbit. The rabbit would get a pneumococcus septicemia, from which it would die, and from the heart's blood of that rabbit we got a pure culture of pneumococcus, so we said that the pneumococcus practically exists everywhere, you cannot avoid it, and as soon as certain conditions come along, where one's vitality is depressed, then he gets pneumonia, there is no way of getting away from it. Now we know that that is not so, that practically all these pneumococci, found in normal throats, which at present are probably in my throat and may be in the throats of most persons in this room and in the population at large, do not belong to the group of pneumococci which are responsible for 80 per cent. of all cases of pneumonia and for over 90 per cent. of all deaths from pneumonia. This makes it very clear from the epidemiological standpoint that the fatal forms of pneumonia are contracted from other persons who have pneumonia or through carriers who are in direct contact with the disease. You see we have exactly the same problem in pneumonia that we have in diphtheria, that we have in scarlet fever, that we have in many other communicable diseases, and we will never be able to control pneumonia, as we shall doubtless hear from those who are to follow, unless we adopt measures based on these facts. The administrative control of pneumonia must be developed along those principles. Hence the importance of notification, classification in the laboratory, isolation and the adoption of antiseptic practices.

So far as the modes of spread are concerned, I have divided them briefly into four categories. If people want to avoid influenza and pneumonia, as well as other inflammations of the respiratory tract, the first and most essential thing is to avoid exposure to infection. That is what we advise in the case of whooping cough, measles, scarlet fever, diphtheria, and all the rest of the infections which leave the body in the secretions from the mouth and nose. Isolate the sick. Keep away, if possible, from people who are coughing and sneezing, and who are laid up with colds or coughs or whatever they may call them. Then when, as at present, the disease is more than epidemic, we might say practically pandemic as I understand it, it is advisable to keep out of crowds and especially out of badly ventilated places like crowded street cars and close, badly ventilated offices, where people have colds and are coughing and sneezing and are spreading the infection broadcast, and where we can hardly hope to avoid it under such conditions.

Of course general precautions, such as those against the common drinking cup, the direct interchange from the mouth by kissing and by the use of handkerchiefs and towels and other

objects, and children's toys that have recently been mouthed, covers one of the important ways of avoiding the infection. One of the habits (which no one should cultivate but everyone should avoid) is the habit of carrying the fingers to the mouth and the nostrils, for that is a bad sanitary habit, and is probably responsible for conveying this and other infections from various sources to our mouth and nose. One of the ways in which these infections are transmitted is one of our social acts, common to friendship. I visit a man who has a cold. He is coughing and sneezing. He obeys the sanitary precept of holding his hand before his mouth, and he receives the discharge there. I just happen to come in and he shakes hands and transfers "the stuff" to my hand. In a little while I go *this* way or *that* way and convey it to my nostrils, and in twenty-four hours I have a chill and a cold just like he had. That may be one of the ways in which these infections are occasionally transmitted. There are a thousand and one ways involved in what we now call contact infection. It is of course not necessary to speak of these details to this audience, because they have often been discussed and are quite familiar.

The second way to avoid these infections is to increase our resistance to them, that is, to improve our immunity and to avoid lowering our "vital tone," whatever that may be. Just how effective these measures may be in some diseases I am not quite certain, but I do feel sure that in this particular group that we are now discussing, namely, influenza and pneumonia, it does play a very important rôle, for we all know people who more or less habitually have colds on the least provocation, we know families in which they are rampant and occur more or less frequently, whereas other persons and families seldom have these infections, although they are more or less equally exposed. We must come to the conclusion that the resistance of some is superior to that of others. Now, all that we know on this subject is, in very general terms, that plenty of sleep and good food and regular habits and out-of-door exercise, and avoiding excess, and everything that makes for proper, clean living, helps our resistance, whereas the contrary undermines our health in this regard and increases our susceptibility.

Popularly and among physicians it is believed that cold and wet are especially baneful. I have never been able to satisfy myself that they have very much influence in this regard whatever. That, however, is only an impression, and impressions mean very little. I have heard over and over again, since these epidemics have been prevalent this winter, that if we could only have three or four real cold dry days we would have an end of it. We have had three or four real cold, dry, clear days, and we have not reached the end. Nevertheless, I hear that statement repeatedly. On the other hand, physicians tell me that if we have a thaw there will be a great increase in the number of colds and sore throats and troubles of the kind that we are discussing. Now, I do not deny that there may be some relationship between atmospheric and

telluric conditions and the prevalence of these infections: there may well be; I can conceive, perhaps, that there is; but I do not believe that that relationship has been demonstrated. I do know, however, that formerly epidemiologists made a particular point of studying such relationships. That has not been the fashion recently, and I believe it would pay to study those relations with modern methods, and we may learn something about them that would really be profitable and be rewardful so far as prevention is concerned. So far as impressions are concerned, if somebody would ask me what seems to be the most important thing about our environment to bring about such conditions of cold, I would say dust, because my personal experience is that if I travel and get exposed to a lot of railroad dust it is pretty apt to light up a rhinitis, although otherwise I rarely have a cold. So that I sort of have a prejudice against dust and think if we could have cleaner air and less street and house dust we should have fewer inflammations of the respiratory tract.

In the third category, of prevention, I would say that it is important to keep the nose and mouth clean. Of course by that I mean the maintenance of the mucous membranes of the upper respiratory tract in a normal condition, so that it may have a normal blood supply, so that it may be normally moist, not too dry and not congested. Of course a person with adenoids, polypus or chronic catarrhal conditions and all that sort of thing has a focus through which he is pretty apt to contract infections. It is an open door not alone for only local but consitutional infections which may be serious, so that keeping the mucous membranes of the nose and throat in normal condition is important. Whether to advise a daily lavage or washing of these membranes or not I am sure we will have to leave to the nose specialists. They advise against it, and consider the dangers of the nose douche in the ordinary hand to be rather serious. So, perhaps, we had better be conservative about advising people using such things as nose douches and the like.

Finally, in the way of prevention I think a word to those who have these troubles is important. This brings me to the fourth category. If persons who have a cold, or "grippe," would only go to bed for two or three days during the height of their trouble they would not only profit themselves very much, for they would get well very much quicker, their convalescence would be shortened, the danger of complications would be lessened, the whole course of the disease I think would be lightened; and furthermore they would prevent many other persons from getting their cold, because we surely know that these colds are most communicable during the early stages, when the mucous discharges are at their height. Of course they continue to be communicable for some days and weeks afterwards in many cases. We have the phenomena of carriers here, as we have in other infections, but if persons would stay in bed, more or less isolated for the first few days of a cold, it would save spreading it to a great many others.

If they would keep out of crowds and take the proper sanitary precautions of using handkerchiefs, etc., whenever they had to cough and sneeze, it would be very helpful.

These remarks are only intended as an introduction to the subject. We must frankly face the fact that we are in black ignorance concerning much of these diseases—even their etiology and modes of spread. Hence our prevention measures do not rest on a secure foundation; however I have sketched in the briefest way what I understand to be our present knowledge of the causes of these infections, and their modes of spread, and we will now hear from those who are to follow more concerning their prevalence and their nature, their epidemiology and their legislative and executive management. It is our pleasure first to hear from Dr. Francis X. Mahoney, health commissioner of Boston, on this subject. Doctor Mahoney.

Dr. F. X. Mahoney, *Boston:* After listening to Professor Rosenau's remarks I am certain that pneumonia and the respiratory diseases should be made reportable to the board of health, so that we might intelligently try to combat them. Our only way of knowing the prevalence of these diseases is through our own acquaintance among the physicians of Boston, unless they occur in epidemic form and we hear of them probably from the newspapers.

In New England the winter season is liable to present many sudden and extreme variations in climatic conditions, and, as one result, catarrhal complaints are almost universal; every one expects one or more "colds," and the organisms which occasion these minor ailments are also the cause of the more severe conditions such as bronchitis and pneumonia which prevail among those most susceptible either at the extremes of age or on account of debility.

In the year 1890 there was a severe outbreak of so-called influenza or grippe, an acute infection, presenting different symptoms from the ordinary respiratory infections, and everywhere accepted as a disease entity. From that time to this "influenza," so called, has figured annually in our death-rates, the number of deaths attributed to this cause ranging from 215 in 1900 to 12 in 1914, and averaging 61 per year. Contrary to what one might expect, there seems to be no increased number of deaths from bronchitis and pneumonia in the years when the influenza mortality is the highest.

For example: in 1900, with 215 deaths from influenza, there were 1,545 deaths from bronchitis and pneumonia, and in 1914, with only 12 deaths from influenza, there were 1,502 deaths from bronchitis and pneumonia.

In the last twenty-five years the general death-rate has declined from 22.66 in 1890 to 16.06 in 1914, a decline of 29 per cent. In the same period the death-rate per 1,000 population from influenza, bronchitis, broncho-pneumonia and pneumonia has declined from 3.49 in 1890 to 2.06 in 1914, a decline of 41 per cent.

This great decline may be more

apparent than real, for it is probable that many cases which in 1890 were credited to pneumonia would today be more carefully diagnosed and credited to malignant diseases, heart disease, nephritis, etc.

The compilation of statistics from death returns must inevitably be accompanied within a certain percentage of error due to faulty diagnosis and it may be presumed that the great majority of these influenza deaths were so reported on account of the clinical picture alone, and that any acute respiratory infection accompanied with great prostration, perhaps even severe pneumonic infections causing death before consolidation occurred, might cause this clinical picture and result in a death return for influenza which ought to be accredited elsewhere.

The recent prevalence of the "grippe," so called, although subject to careful laboratory examinations by different workers, has failed to show any prevalence of the influenza bacillus. Rather the indication is of infection with a streptococcus or pneumococcus of especial virulence.

The newspapers gave front page articles for awhile on the presence of a new and fatal disease, "acidosis," among children. The prominent symptoms of the cases, so called, were:

1. Persistent vomiting.
2. Intense thirst.
3. Prostration.
4. Subnormal temperature.
5. Slow small pulse.
6. Moist skin.
7. Choleraic diarrhœa.

"Acidosis" signifies an excess of acids of the acetone series in the blood. It is well known as a symptom of diabetes and is found in the blood of children suffering from acute infections. It is no more a disease entity than is albuminuria or nosebleed. The physician who assigns the cause of death as "acidosis" simply acknowledges his ignorance of the real cause of death and gives a symptom which may arise from one of several causative factors. If these cases among children showing intestinal symptoms occurred in the summer time they probably would be called cases of acute infectious ileocolitis.

The laboratory workers of the Boston Health Department examined nasal secretions from about twenty of these cases and were unable to isolate influenza bacilli.

One fatal case showed abundant growth of streptococci. Another fatal case was autopsied by Dr. Oscar Richardson who reported the death as probably due to infection with a microörganism belonging to the streptococcus-pneumococcus group.

Doctor Richardson says:—

"The portal of entrance of these infections we are sometimes reasonably certain of, but in many cases it is but vaguely known, or not known at all. The conditions, however, seem to be as follows:—The mucosæ, or lining membranes, of the nose, Eustachian tubes, middle ears, the gastro-intestinal tract, and the genito-urinary tract, harbor at times—and some of them pretty much all of the time—pathogenic micro-organisms

which, under given conditions, may find congenial soil in these regions, and multiply and increase, producing diseased conditions from the absorption of their toxins or by their entrance into the blood-stream, producing septicæmic infections.

"It is not unusual to find infectious of the mucosæ very common in winters when the temperature ranges from very low to high extremes, accompanied with like changes in humidity and irritating atmospheres. The out-door life of the people, in cities at least, ceases to a considerable degree; they travel more in groups within cars; they attend theatres and other functions, and the general coughing, spitting and sneezing, and personal contact, probably accounts for the spread of the infections, whatever they are. In many of the cases the infection practically confines itself to the mucosæ, and in a short while immunity is established and recovery takes place. In many other cases, however, what are apparently infections of the blood-stream take place, and at times a good many deaths occur.

"As to whether many of these cases are due to some unknown micro-organism, is a fair question. It may be possible, but if so, we are still reasonably sure that certain of the micro-organisms which inhabit the mucosæ may, as so-called secondary invaders, infect the blood-stream and produce death. It is well to remember that although we say we do not know the organism of scarlet fever, yet, in the fatal cases there is usually a profound streptococcus infection. Infections with influenza bacillus occur, but it still remains to be proved that this organism is as common a source of infection as it is credited with being.

"Much confusion has arisen from the use of the term 'acidosis.' This condition signifies an excess of acids of the acetone series (diacetic and oxybutyric) in the blood. It occurs in diabetes mellitus and is due to the cause of the diabetes,—whatever that is. In other words, 'acidosis' is a condition associated with a disease, the cause of which may be known or unknown. In cases of infection where present, its presence may be due to the profound catabolic changes resulting from infection. It is at least hypothetically possible, of course, to think that the acid intoxication in some cases might be so extreme as to be the final straw in pushing the case over the death border, like the acid intoxication in diabetic coma.

"As a result of the consideration of what I have stated above, I think it is reasonably certain that the majority of the cases in the so-called 'acidosis' epidemics are due to infections with the well-known micro-organisms which inhabit the mucosæ of the body, and that in many of the cases where death ensues it is due to an infection with micro-organisms belonging to the streptococcus-pneumococcus group and septicæmic in character."

"Dr. George P. Sanborn of the Boston City Hospital in a study of specimens from twelve clinical cases found the bacillus of influenza in three. He says:

"'The percentage of positive cases in this group corresponds to that found

in the two groups above noted, and clinically diagnosed as influenza. It is therefore a reasonable supposition, not susceptible of proof, that in this group of cases we are dealing with one or more types of influenza.

"'In the original cultures, hemolyzing streptococcus, streptococcus viridans, micrococcus catarrhalis, and pneumococcus, all possible causes of respiratory infection, were found. Because of the presence of these possibly pathogenic bacteria, proof that the influenza bacilli found are the causal microörganisms, is impossible. To this end, in these cases or in any other similar group, the demonstration of specific antibodies in the blood of the infected patients is required.'"

It seems to the writer altogether probable, in the recent prevalence of sickness, that colds, bronchitis, pneumonia, ileocolitis, acidosis (so called), and influenza have all resulted from the same infection, the variations in the clinical picture being due to differences in resistance of the various persons affected as well as to various sites of infection.

In the vital statistics from December 1 to January 2, 444 deaths were reported to the health department with pneumonia as the principal cause of death. Eighty of these were children under five years of age, 166 were from 60 to 95. So it can be seen that almost 50 per cent. of the deaths were among the young children and the old people. As the contributing cause pneumonia was present in 138 deaths, appearing, for example, in heart disease and nephritis thirty-seven times. The grippe thus seems to particularly affect the old people. In this period there were 42 deaths from grippe, twenty-five of which were of persons over 60, the oldest being 101, and nine under 5 years. This disease was present as a contributing cause twenty-seven times. Here, again, heart disease and nephritis led, appearing thirteen times as the principal cause in this group. Influenza appeared ten times with pneumonia. As a contributing cause grippe was invariably found in persons over 60 years of age.

Mr. J. C. Coffey, *Worcester:* Mr. Chairman, when I was asked in an informal way by the secretary to relate the experience of Worcester in the prevailing epidemic, I agreed. As the other speakers have stated and the members were all aware, we have no means as health officers of knowing how prevalent this disease may be, because it is not reported to us and the only evidence we have of its prevalence is what we get in the death returns. So I have confined myself entirely to showing the difference between the deaths occurring from these respiratory diseases in 1915 and in this present year for the first three weeks of the year. Worcester unfortunately has had no guardian angel to ward off the epidemic from her, and she has suffered considerably in the number of deaths. The total deaths of the first three weeks of January, 1915, reported to the board of health office, were 147. The total for the first three weeks of this year was 244. Of these total deaths 22 in 1915 were caused by respiratory

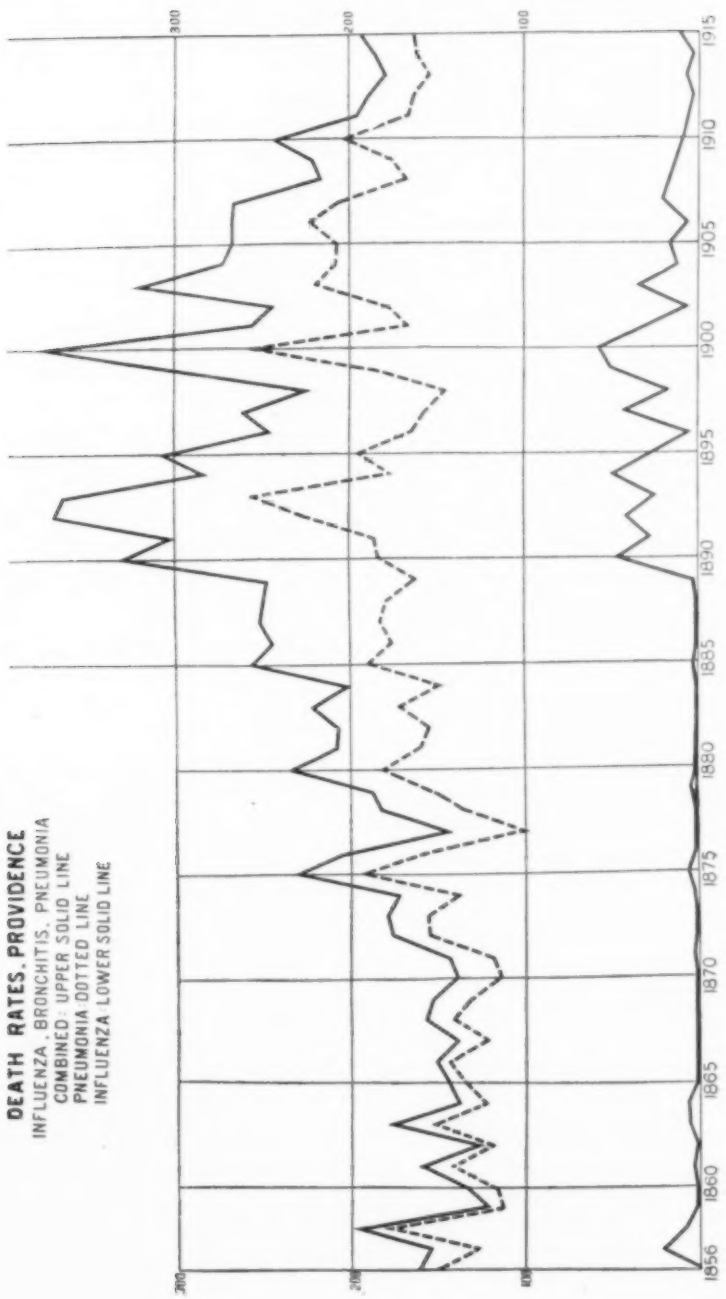
diseases, or 14.9 per cent. of the total causes of death. This year 71 were reported from those causes, or 29 per cent. of the total deaths occurring. These were divided in the following way: From acute bronchitis in 1915 there were two, in 1916 six; from bronchial pneumonia, in 1915 nine, 1916 eighteen; lobar pneumonia, 1915 ten; 1916 thirty-six; grippe, 1915 two, 1916 eleven. The total for 1915 was: males 8, females 14, total 22, and the total for 1916: males 39, females 32, total 71. Of the total, 56 were more than 50 years of age, so you can see that the prevalence in Worcester in the causes of death was largely augmented by this present epidemic.

In talking with several of the physicians who have a large general practice, one physician told me that he saw no grippe at all, that his cases were largely colds and pneumonia. Another physician, who has charge of a large private school in Worcester, said his cases were almost entirely tonsilitis, they had no coughs at all, but it was followed by extreme weakness and prostration. And so it went. Most of them said that the grippe was not prevalent, they saw no grippe, but the death-rate shows that something took a large toll in Worcester.

Dr. Charles V. Chapin, *Providence, R. I.:* I greatly enjoyed Doctor Rosenau's very clear statement of the mode in which these diseases are spread, and the very practical advice that he gave in regard to avoiding them. I had hoped that he would be able to give us some more definite knowledge of the causation, particularly of the disease which we call influenza, but apparently the laboratory workers have not yet been able to arrive at a definite conclusion.

Influenza seems to be like most other diseases. If it strikes in, in a community where it has not prevailed before, most of the cases pursue a typical course, and it is easily recognized. After that, as it comes in epidemic waves, we get a great variety of atypical cases, perhaps owing to the fact that many are in partially immune persons, and perhaps owing to changes in the causative organism itself.

Both Mr. Coffey and Doctor Mahoney spoke about the great variety of forms in which the prevailing epidemic appeared. There are a few of you, probably, who will remember how it appeared in 1889. In Providence it appeared on the 17th of December; it lasted about six weeks, and the great bulk of the cases were very typical. They came on suddenly, often with a chill, with marked headache and very severe muscular pains, and quite a high fever, and accompanied with coryza and cough, bronchial symptoms, and of course great prostration. Recovery was slow. The outbreak reached its climax about the 6th or 7th of January, and the maximum number of deaths, I think, was in the week ending about the middle of January. Then it rapidly disappeared. It seems to me that we must have been dealing then with a real entity, a distinct new disease. I do not mean to say that the type of organism may not have existed in the community before that.


DEATH RATES, PROVIDENCE
INFLUENZA, BRONCHITIS, PNEUMONIA
COMBINED: UPPER SOLID LINE
PNEUMONIA DOTTED LINE
INFLUENZA LOWER SOLID LINE
300
200
100
1856
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915

What we call grippe may possibly be due to some type of pneumococcus or streptococcus. If so, it certainly was a new strain, which our people were not familiar with and were not immune to. It may be due to the influenza bacillus. At any rate, it seems to me that there was a new disease.

The relation of this disease to pneumonia and bronchitis is illustrated by this chart, which shows the mortality per 100,000 of population in Providence for the last sixty years. Of course, we are very much handicapped in any epidemiological study of these diseases on account of the uncertainty about the diagnosis—this is particularly true in regard to grippe. During epidemic periods we get a great many reports of influenza. During the latter part of the period we get a good many more than we do in the first part, because physicians' attention is called to the disease.

There has been a very considerable change in the last sixty years in regard to diagnosis of pneumonia. There has been a great improvement in diagnosis. According to this dotted line, which represents pneumonia, there was a gradual increase in that disease, also an increase in bronchitis, which was a good deal more than pneumonia. During the period from 1856–86 the increase in these two diseases, which ought really to be classed together, was due chiefly, I believe, to a better diagnosis on the part of physicians. In former years, along back in the 50's and 60's, a great many cases of death that were certified to as old age were really due to pneumonia and today would be certified as due to pneumonia. I am inclined to think that a good many cases of consumption were then reported to be due to bronchitis. I think there is little doubt that a good many deaths from pneumonia would years ago have been called death from convulsion or death from meningitis.

After careful study of the different causes and their change from year to year during this period it would seem to me that the apparent increase in pneumonia and bronchitis up to about this time—that is, the 80's—was due to a transfer from other causes, and was not probably due to an increase in the prevalence of these diseases. But about that time—that is, in December, 1889,—there was, I believe, a very marked increase. In the five years previous to 1890 the January death-rate was about 75, from the respiratory diseases, and in January, 1890, the first year of the grippe, there were 175. There was a great increase, and it was a real increase, and I think it was probably due to the prevalence of a new disease, influenza. Whether the germ of this disease directly causes pneumonia or predisposes to it I don't know, but something new, some new disease entity, came in, which not only caused death without marked pneumonia symptoms, but caused a great increase of acute pulmonary disease, and you can say that from that time to the present time there has been a correlation between the presence of grippe and the presence of pneumonia. That is brought out particularly in the early 90's, when the diagnosis of this disease on account of its then more

typical character was better than it is now. This correlation not only shows by years, as you can see, but it is shown by months. Usually the epidemic of influenza and grippe does not last much over a month, and during the first eight or ten years if grippe came in January pneumonia, too, increased in January, if grippe came in March pneumonia increased in March.

In the last few years pneumonia has been getting back to its level in the 80's. In the last few years it does not seem to me that we have had much real grippe, grippe of the kind that would cause disease. The first epidemic of that which we have had in Providence for a good many years was in last March and April, and we had quite an increase then in respiratory diseases, in pneumonia and bronchitis. I think that we had more deaths last March than we are going to have this year in January.

We have heard a great deal about the increase in pneumonia, and its taking the place of the great white plague. I am sorry I did not have a line showing the decrease of tuberculosis, which in the 50's went away up above the edge of the chart and down here began to cross pneumonia, and has since then been lower than pneumonia. But, the apparent increase in pneumonia up to about this period I believe is apparent only. The increase since then, I think, must have probably been due to the presence of influenza, and as the virulence of that disease waned during the last few years our pneumonia has come down to where it was in the 80's.

Discussion.

Dr. E. H. Place, *Boston:* There are a great many popular superstitions regarding these common infectious diseases that I would like to have discussed. I am greatly interested myself. I know that the scientific evidence is rather slim, and I feel that it would be of very great value to get a number of opinions. Perhaps the commonest superstition is in regard to drafts. Everywhere you see these cases the layman ascribes the disease to some exposure to cold. My own views have always been that chilling of the body was a factor in inducing acute infectious disease of the upper respiratory tract, including pneumonia, and that patients suffering from diseases like measles, laryngeal diphtheria, and diseases which particularly predispose to pneumonia, are made distinctly more susceptible to the danger of pulmonary infection by marked chilling of the body. How this is produced, or whether it really is the result of chilling, is very difficult to say, but it has always seemed to me that if patients are exposed sufficiently, so that the extremities become chilled, the skin becomes cold, the circulation is disturbed through withdrawing from the surface of the body the amount of blood which ordinarily is there distributed, in order to save the rapid dissipation of heat which they cannot afford to lose, and the resulting congestion of the splanchnic areas, must be a factor in reducing the resistance of the tissues. The layman, however, always looks upon this as a draft, and many of our pneumonia cases which are treated by the open air method cause great anxiety to parents, because they think they are in a draft. They very much object to the windows being opened. Practically, there is no case that I have been connected with which has been treated by the open air method but what the parents have had to be convinced that it was not the draft, it was not the fresh air or the moving air that was dangerous, it was the chilling of the patient.

It appears to me that there is a striking difference between the common infections of the nose and throat and larynx and trachea and infections such as we have been suffering

within the past month and a half, this acute respiratory affection, which is very contagious, and which sweeps through families and institutions, leaving in its wake many cases of broncho-pneumonia and many cases of lobar pneumonia. That opinion, however, has been somewhat shaken by Doctor Rosenau's observations, that there is a striking difference between the ordinary lobar pneumonia which occurs here and there without any particular evidence, certainly not any evidence in my experience, that suggests transmissibility such as measles and diphtheria have, and the transmissibility which is so striking in these acute involvements of the upper respiratory tract.

I should personally be very glad to have some one who is acquainted with them give us the facts in regard to the influence of climate. These diseases particularly occur during cold months. I would like to ask Doctor Rosenau if he has not the facts bearing on the prevalence of these diseases in climates which are more equable than ours, and particularly in regard to the time of year in which they occur in such climates as the Southern States and California, and the relation of climatic influences to the prevalence of these diseases.

The last point which has struck me as of importance in these infections is what we call local resistance. It was spoken of today under adenoids and large tonsils, etc. Certainly in some diseases, like diphtheria, the resistance of the mucous membrane, that is, the invulnerability of the mucous membrane, plays a big part. It is very obvious, I think, to those who are dealing with diphtheria considerably, to notice that if a patient has been suffering from a disease which has made the mucous membrane more vulnerable, exposure to diphtheria is more likely to be followed by that disease. It is equally obvious that when it comes to a disease like measles, the invulnerability of the mucous membrane has nothing to do with it. No matter how free from disturbance the mucous membrane is, an exposure to measles would be followed by that disease if the patient was not immune. The question comes whether these acute respiratory diseases, such as we have been considering, require a special vulnerability of the mucous membrane, such as diphtheria especially requires, or whether they may not be like measles, which will invade the mucous membrane no matter how normal it may be.

Doctor Palmer: Mr. Chairman, I am reminded by several remarks made here about the susceptibility of the mucous membrane to a most interesting address we had before this Association quite a number of years ago on the effects of our superheated houses, due to lack of moisture. I would like to again call the Association's attention to what I think is a very vital fact, and but little recognized, that the reason for our epidemics in the winter is because of the kind of air that is breathed by most people in superheated and dry houses. A man in my office a few days ago said that his wife had had a cold all winter. I said, "Have you got any water in your furnace?" "By Jove," he said, "I have not thought of that for years. There is a place for it, but I have not had a drop of water in it for the last five years. I bet that will help some." I believe, gentlemen, we don't realize how much harm is done from the lack of moisture in our houses in winter. Our mucous membranes become dryer than normal, supersensitive to these outside influences, and that may be a large causative factor in the increase of these so-called influenzas and grippe.

I don't know that I ever heard any one speak of a peculiar symptom that I associate with grippe. I don't know as it has any value or any meaning, but I have noticed this fact: that when I get the muscles of the eyes lame and aching it corresponds in the early stage with what I choose to call grippe. I have seen it so many times that I regard it as almost pathognomonic of so-called grippe. I give it to you for what you think it is worth.

Dr. C. V. Chapin: Mr. Chairman, I would like to ask Doctor Place if they had less influenza in their hospitals than occurred in the general population during this outbreak, and if so, to what they attribute it.

Dr. E. H. Place: *Boston, Mass.:* I have no figures on the incidence in the community. I know that the disease was prevalent in the hospital. It was not more prevalent in the contagious disease department than it was in the main hospital; as a matter of fact, it was less prevalent. We had a smaller number of nurses and a much smaller number of house officers ill at the contagious hospital than in at least two of the larger general hos-

pitals. We had no deaths among those in the contagious department, while there were at least three deaths among the hospital people in two of the large hospitals. I had no case that could be diagnosed grippe on sure evidence. The only cases in which we felt sure at all of the bacteriology were cases of trachitis, and both of those cases showed pure cultures of pneumococcus. One of them occurred in a family in which this so-called grippe had been going on, the other patient having an ordinary attack of respiratory disturbance. This patient developed a marked obstruction to breathing, and came to my attention in that way. The obstruction in this case was due to tremendous masses of dried mucus. The mucus was extremely tenacious, as tenacious as glue. This tenacious mucus was what caused the obstruction. This mucus was just loaded with typical pneumococci with the morphological characteristics, but died before the agglutination test could be done. It was not very viable in cultures. I saw no cases that acted like grippe, and I think that most cases that I saw recovered very rapidly and did not have all the lingering, delayed recovery of strength that we usually associate with real influenza.

DR. M. J. ROSENAU: I may be given a few minutes, perhaps, to make myself a little clearer and to try to answer some of the questions that have been propounded.

First of all, it seems to me that part of the confusion and a certain amount of misunderstanding among those who have spoken this afternoon is due to the fact that we are not discussing one clear-cut disease, but we are discussing more than a group of diseases, we are discussing several groups of diseases. The disease we call influenza, or grippe, is doubtless not a single entity, and certainly the disease we call pneumonia we now know is not a single entity. Furthermore, there is this to be considered. Take any one of these diseases. Take this very one of "grippe." We have grippe in interepidemic years, when it shows no special degree of communicability whatever; it simply smoulders, there is a case perhaps now and then which might be recognized as such. In fact, as we know in Boston, it has been found that there are carriers when we hear nothing of grippe, but those carriers have the bacillus influenza, or symptoms which perhaps could be recognized or would be called influenza when the disease is epidemic. Then we have times like the present, or more so, like in 1899 and 1890, which I remember very distinctly, when the disease showed not only great virulence, but great communicability. Influenza then was just as contagious as measles; this year it is not quite so bad as in 1889 and 1890. Then we have different degrees of communicability.

Now, we have exactly that same phenomenon with pneumonia. As a rule pneumonia is not very communicable. Nobody would call it a "contagious" disease, like measles or smallpox, nor under ordinary circumstances is it as "catching" as diphtheria or scarlet fever, yet there are times and places (in camps, on shipboard, etc.), when pneumonia shows this same degree of increased virulence and increased communicability. We have such differences, which must be considered, so that I did not mean to compare pneumonia to measles without qualification. I don't think Doctor Place misunderstood me in that way. I only compared it to measles and scarlet fever as examples in that group of diseases in so far as it is communicated in a similar way. The modes of transmission are alike, but the degree of communicability and the factors concerning resistance and immunity of course vary in each one of these diseases, and in each disease itself at different times under different circumstances. Let us consider some of those circumstances that play such an important part.

We regard pneumonia ordinarily as a cold weather disease, because here in this climate it has a distinct relationship to cold weather. If you look at the curve of any city you will see it go up in winter and down in the spring and summer, and up again next year; and it follows such a curve of winter prevalence year after year with considerable regularity. That is a matter of general understanding and general knowledge, although we have pneumonia, and often plenty of it, in warm weather and also in the spring and in the fall. But we cannot consider pneumonia really a cold weather disease, because if you go to the tropics it is much more virulent than it is here. Even in Siberia or in Canada or the coldest countries we know of we find pneumonia to be no more prevalent and more virulent than it is in the tropics under certain circumstances. It may have been a surprise to

most of you, doubtless, to know that the disease which caused the second highest death-rate among the workmen of the Panama Canal was pneumonia. Following the great problem of malaria, so efficiently controlled, was this great question of pneumonia. They had exactly the same problem among the diamond workers in the Rand, which General Gorgas went to South Africa in order to investigate. Now, how did they control pneumonia under those conditions in the tropics? I happen to be familiar with the methods that were in use, and I will not recite all the failures they had. The only way they succeeded in making any impress upon the pneumonia figures under those conditions was to regard it just as a communicable disease, spread just as diphtheria and as measles and as scarlet fever are spread, and to take measures accordingly; in other words, to scatter the people, to prevent crowding. The people brought close together in barracks in close contact with each other, readily contracted pneumonia from each other. When they got them dispersed, scattered, separated; just the one factor of preventing overcrowding helped to prevent the dispersion of this virulent form of pneumococcus and diminished the amount of pneumonia. It was really one of the most wonderful object lessons, and one of the most useful bits of information that we got out of what was otherwise the great and brilliant work of General Gorgas and his colleagues in building the Panama Canal, this question of pneumonia. Gorgas went to the Rand at the request of the British Government and the owners of those great diamond mines, discovered the same factors were in existence there and applied the same principles.

Now, why is pneumonia so much more virulent in the tropics than it is here? It is not because the weather is warm there or the weather is cold here; it is because it has what might be called a virgin soil, an unsusceptible population, to work upon. The people who were brought to Panama to work on that canal came from places where pneumonia does not prevail, and they had no degree of resistance, such as we are all getting from association and more or less frequent contact with the pneumococcus, which has raised the general level of our resistance to that infection this is a common phenomenon in disease. If you bring in people who are unaccustomed to it, then it is much more virulent with them. We have the same thing with measles. If measles gets into a South Sea island it is a tremendously virulent and fatal disease, whereas with us, with proper care, it is much less virulent.

It seems to me those are the main factors. But we get many other influences, for instance, such as Doctor Palmer recites. He believes that overheated, dry air is especially bad. We hear from somebody else that very cold and chilling weather is especially bad. Somebody else, I think I heard say, that dust is especially irritating. These are bad, of course, but after all they are secondary factors, which I think, depress our vitality or our resistance, so as to make us more susceptible; or if we get pneumonia perhaps we get it in severer form than we otherwise would get it. We only need think of drunkard's pneumonia. A man lying on the street drunk nearly freezes, because we all know the effects of alcohol and how there is a general dissipation of heat, and there is therefore actual chilling of the body, and how common it is to have pneumonia under such circumstances! When a drunkard gets pneumonia it is "good night" with him. I have never seen one recover. And all of us who have had experience in city hospitals have seen a number of such cases. It is the same thing with a person depressed with Bright's disease or other debilitating disease, in which the vitality is altered in just such a way, so that the personal factor here does play a part. The biological factor, the resistance and immunity as we now understand it, plays another very large part. An overshadowing factor is the virulence of the infecting germ. We must not forget the factor of communicability, and for the actual control of these diseases we have to treat them as communicable or contagious.

RECENT ADVANCES IN OUR KNOWLEDGE OF THE INFECTIOUS DISEASES.

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This paper has been prepared for the busy man who, while interested in infectious diseases, has not the time to follow up the literature on the subject constantly. Professor Arkin's contribution will also serve to refresh the memory of those who are actively engaged in health department work of all kinds.

SINCE most of our members are busy medical practitioners, I thought that it might be of interest to discuss some of the recent advances in our knowledge of the etiology of the infectious diseases, especially from the standpoint of their prevention. A conception of the modes of transmission of the infectious diseases is absolutely necessary before we can hope to establish satisfactory preventive measures.

I shall not take time to review the past history of our knowledge of the infectious diseases, but shall present some of the more important recent developments. We are all acquainted with the great work of Pasteur, who demonstrated that fermentation and decay are bacterial processes, and who suggested that our infectious diseases are produced by minute microörganisms. Then came the work of Robert Koch, who placed bacteriology on a firm basis by his discovery of artificial media for the cultivation of bacteria outside the body. This was followed by the discovery of the germs which are the causes of many of our infectious diseases, as diphtheria, typhoid, tuberculosis, tetanus, anthrax, etc.

But recently, improvements in technique have made possible investigations in entirely new fields. Among these may be mentioned the cultivation of animal tissues in vitro, Abderhalden's work on the defensive ferments, studies on anaphylaxis, the study of filterable viruses of poliomyelitis and rabies, the isolation and cultivation with ease of the spirocheta pallida of syphilis, an anaërobe, and other spirochetes, as well as the protozoa of malaria, and the bacillus of leprosy. Much of this progress has resulted from careful animal experimentation in the laboratory and from the coöperation of the laboratory man with the clinician. With this increased knowledge of the nature of disease and its diagnosis, there has developed a new and distinct specialty, namely preventive medicine. The factors which have contributed the largest share to the development of this new field of work are undoubtedly the ones just mentioned, the advances in bacteriology, followed by the recognition

of the importance of insects in the transmission of disease, animal experimentation, and the study of the filterable viruses.

Let us consider some of the recent investigations which have so greatly contributed to our knowledge of the communicable diseases.

Measles.

This disease was the cause of 6,598 deaths in the registration area of the United States in 1910, and is therefore not a necessary incident of childhood. Our knowledge of the etiology of this disease was very incomplete until Anderson and Goldberger demonstrated in 1911 that the disease could be produced in the monkey by inoculation with blood from human cases, provided the blood is taken before or shortly after the period of the eruption. Even the Koplick spots appear in the monkey. The virus was shown to pass through a Berkefeld filter, hence belongs to the group of filterable viruses. It is present in the nasal and buccal secretions up to the time of convalescence when its infectivity disappears. The disease is therefore transmitted by direct contact. Hektœn has transmitted measles from man to man by injection of blood. The desquamated skin does not carry the virus.

These experiments explain the nature of the virus, its entrance into and exit from the body. It has been known that, as a rule, cases are not infective after convalescence is well established. The noninfectivity of the scales is of great importance from the public health standpoint. The greatest infectivity of measles is very early, generally before the diagnosis has been made. The virus may resist drying or freezing for twenty-four hours. Immunity acquired after an attack is usually absolute. Natural immunity is rare.

Scarlet Fever.

Scarlet fever was named by Sydenham in 1685. Early in 1911 Cantacuzene and Bernhardt reported the production of scarlet fever in the monkey. These results were also obtained by Levaditi, Landsteiner, and Prasek. The disease produced experimentally seems to be caused by the specific virus of scarlet fever and not by the streptococcus. The work indicates that the virus is present in the tonsils and on the tongue, in the blood and lymphatics. The nature of the virus is at present entirely unknown.

The importance of the disease is realized when we observe that nearly 50 per cent. of all persons have had scarlet fever. In 1910 there were over 6,000 deaths in the registration area of the United States from this disease. The importance of the streptococcus as a secondary invader in scarlet fever is recognized by all, and recently Dick and Henry, working at the Memorial Institute in Chicago, have isolated several microörganisms from the blood and urine of scarlet fever patients. These organisms, some anaërobic, may be of importance in causing the nephritis which so commonly occurs in this disease. The use of vaccine and immune sera for streptococcus and the other microörganisms should be of considerable value in the treatment

and prevention of the complications of scarlet fever, due in large part to the streptococcus. Kessler at the Memorial Institute for Infectious Diseases has demonstrated the presence in the blood of scarlet fever patients of a complement-deviating substance when using as antigen the extract of lymph glands from fatal cases of scarlet fever. The complement deviation occurred in 68 per cent. of the cases. These results suggest the presence of the causative agent in the cervical lymph nodes. The virus is present in the buccal and nasal secretions, which are the usual source of infection.

Scarlet fever may be spread through milk, and several epidemics have been traced to milk infection. Strict isolation and quarantine are at present our best means of prevention. Especially important is the recognition of atypical and abortive cases.

Rabies.

Rabies or hydrophobia is a disease due to an unknown virus present in the central nervous system, and also in the salivary glands, adrenals, and pancreas. The virus produces characteristic changes in the ganglion cells. It enters the body through a bite by a rabid animal, usually the dog. It is carried along the nerve fibers to the central nervous system, thence to the salivary glands. The incubation period is 20 to 40 days, but varies with the location of the bite and nature of the virus. The Pasteur treatment has reduced the mortality rate from 16 per cent. of those bitten to only 0.9 per cent.

The virus of rabies is filterable. The Negri bodies found in the brain are probably a stage in the life cycle of a protozoan parasite which is the cause of the disease. Noguchi claims to have been able to cultivate the organism in pure culture, and to reproduce the disease.

The Pasteur treatment consists in the injection of attenuated virus obtained by infecting rabbits and drying the spinal cord. It is of no value after symptoms have developed. In such cases the mortality is 100 per cent. Recently Moon has reported satisfactory results in the treatment of rabid dogs with quinine, but others have been unable to verify the findings.

The importance of immediate cauterization of the wound with fuming nitric acid, and of watching the animal for ten to fourteen days, or until symptoms develop, is of course recognized by all physicians.

Cerebrospinal Fever.
(*Epidemic Cerebrospinal Meningitis.*)

The cause of this disease is the diplococcus intra-cellularis meningitidis, or meningococcus, first described by Weichselbaum, in 1887. The organism is found in the spinal fluid. It may also be present in the blood stream, lungs, or joints. The organism is easily killed outside the body. Carriers of this germ have been found and they probably play a considerable part in the spread of epidemics and also explain the occurrence of sporadic cases. The germs in the naso-pharynx reach the meninges and cause cerebrospinal fever, probably by way of the blood stream. They may also involve the sphenoidal sinus.

The disease can be recognized by the characteristic symptoms. In addition, there is usually a leucocytosis of from 25 to 40,000. Spinal puncture is most important in the diagnosis. Increased pressure, with presence of large numbers of cells, increase in albumin and globulin, and the finding of the meningococcus make the diagnosis. Flexner's serum has reduced the mortality from 80 per cent. to 15 per cent.

In the prevention of the disease, isolation of carriers is very important. Secretions of the naso-pharynx should be properly disinfected. Sprays of antiseptics should be used. Vaccination with dead meningococci of persons directly exposed to the disease should be carried out.

Smallpox.

Smallpox has been produced experimentally in the monkey. It is the only susceptible animal. In the calf, vaccina develops instead. Hence, vaccina and smallpox are undoubtedly due to the same virus. The nature of this virus is entirely unknown, as also its mode of entrance into the body. The infection may be air-borne to a limited degree. Secretions of the nose and throat are highly infectious and these are probably the chief agents in causing infection. Recently, Noguchi has succeeded in cultivating the virus in the testicle of rabbits, apparently in pure culture. This will greatly facilitate the production of the vaccine virus, and render it more safe from contamination.

Whooping-Cough.

In 1900 Bordet and Gengou reported the observation in sputum of whooping cough patients of a small organism which they isolated in pure culture six years later. This organism is the Bac. pertussis, or Bordet-Gengou bacillus. This organism was constantly present in these cases, and the blood was found to contain an antibody specific for the organism.

Recently Mallory and others have verified the above findings and discovered the presence of large numbers of bacilli between the cilia of the trachea and bronchi. These interfere with the normal action of the cilia and cause an irritation which produces the cough. Mallory has been able to produce the same lesion in young animals with pure cultures of the bacillus. The action of the bacilli is largely mechanical, interfering with the removal of secretions and inhaled particles. The organism also causes a lymphocytosis. The organism is abundant in the early stages of the disease, when it is most communicable. The disease is transmitted by the secretions from the mouth and throat chiefly by direct contact. The microörganism has been noted in dogs and also in cats. These animals may be factors in the spread of the disease.

The infection usually confers an immunity. The pertussis vaccine has been used as a prophylactic measure with some success. In the treatment of whooping-cough the vaccine is of little or no value.

The human race possesses no natural immunity to the disease. Children from six months to six years of age are most susceptible; most cases occur under two years. Girls seem to be more susceptible than boys.

Prevention consists in isolation of infected children and disinfection of nasal and buccal secretions, with vaccination of susceptible individuals.

Typhoid Fever.

Although the typhoid bacillus was discovered by Eberth in 1880 and grown in pure culture by Gaffky in 1884, the evidence was not conclusive that this organism was the true cause of typhoid fever. Only recently has all doubt been removed. The proof of the relation of the typhoid bacillus to typhoid fever was furnished by Metchnikoff and Besredka in 1911. They succeeded in reproducing the disease in the higher monkeys. Ordinary laboratory animals are not susceptible.

Blood culture will reveal the presence of the typhoid bacillus in a large percentage of cases. The organism is found in the rose-spots, lymphoid tissue of the intestine, urinary passages and often in the gall bladder. Localized abscesses may complicate the disease and contain the typhoid bacillus. The blood serum gives the specific agglutination reaction, the Grüber-Widal test. However, a positive Widal reaction indicates one of several conditions:

1. An active attack of typhoid fever.
2. A localized infection with the typhoid bacillus.
3. The occurrence of typhoid fever within a period of two to four years.
4. Vaccination against typhoid fever.

A negative reaction does not always rule out typhoid infection, because the reaction does not become positive until the tenth to fourteenth day of the disease. In other cases, the reaction may disappear for short intervals or be entirely absent. Vaccination produces a positive Widal reaction in about 75 per cent. of cases. However, immunity may be produced without the presence of a positive Widal reaction.

The greatest advance made in relation to typhoid fever has been the demonstration of the prophylactic value of typhoid vaccine. Properly administered, the typhoid vaccine protects against infection as has been shown in all parts of the world. The results may be even better with the use of the sensitized vaccines, suspensions of killed typhoid bacilli treated with immune serum. These cause less marked reactions and greater antibody formation.

One of the problems yet to be solved is the prevention of the development of typhoid carriers, people who may discharge typhoid germs for long periods of time after apparent recovery from the disease. The typhoid carrier is a serious problem when one considers that about four per cent. of all persons having typhoid fever become carriers. Furthermore, there are carriers who have never shown symptoms of the disease, hence cannot be identified except by bacteriological examinations. The organisms are usually located in the gall bladder, and we know that about 20 per cent. of the cases of cholelithiasis give a history of typhoid infection. No satisfactory treatment of these cases has been discovered. Urotropin is of little value. The treatment of the typhoid carrier is the subject of considerable experimental work at the present time.

Much of this work is being conducted with dogs and rabbits, in whom the carrier state can be produced. This is due to localization of the typhoid bacillus in the gall bladder.

Typhus Fever.

Typhus fever appeared in the United States in epidemic form in 1892. Since then very few cases have been reported. That the disease exists in this country has been shown by Anderson and Goldberger who demonstrated that Brill's disease is identical with typhus fever. Blood taken from patients with Brill's disease will produce disease in the monkey. An attack of Brill's disease confers immunity to typhus, and vice versa, hence, the two diseases are identical. The transmission of the disease has been shown to be by the bite of the body louse. The disease has been reported in several large American cities in the past two years. It exists in the mild form.

The etiology of typhus fever is now known. The most recent advance in this line has been the demonstration by Plotz of New York of an anaërobic bacillus in the blood of typhus patients, which produces the same febrile reaction in the guinea pig as typhus blood. He also obtained complement fixation with his bacillus and the blood of typhus patients. In all probability this organism is the cause of typhus. It was not found earlier because of its anaërobic property. Vaccination with this organism may prove to be a valuable preventive measure.

The prevention of typhus consists in:

1. Destruction of all lice.
2. Inoculation with a mild type of the disease (Brill's disease) which confers an immunity.
3. Vaccination with Plotz's bacillus.

Acute Anterior Poliomyelitis.

This disease was imported from Europe where it has been long endemic. In 1909 Landsteiner and Popper caused the disease in monkeys by inoculation with spinal cord emulsion from a child who died of this disease. Later Noguchi and Flexner reported the cultivation of a minute organism. The organism is contained in the secretion of the nose, throat, and in the intestine, and there are no doubt carriers of the disease. The virus reaches the nervous system through the lymphatics. The virus is so small as to pass through a fine filter. The spinal fluid contains the virus early in the disease.

The organism is easily killed by heat and disinfectants. It consists of small ovoid bodies, 0.15 to 0.3 micron in diameter. The disease has been produced in monkeys with the pure culture. Distemper of dogs may be caused by the same infection. Hence, one should isolate dogs with the disease. Flies should be excluded by screens. Nasal and mouth secretions contain the virus, and should be disinfected. It may also be present in the trachea and small intestines of infected persons. The stable fly may transmit it but is not the usual carrier of the infection.

From the clinical side, this disease should be recognized early, before paralysis has set in. The usual early

symptoms are: sudden restlessness, loss of appetite, temperature of 100 to 103° F. and vomiting. Drowsiness, hyperæsthesia, general weakness, and headache are common. Spontaneous pain, and pain on passive motion are frequent. There are three forms of the disease to be recognized, according to Peabody, Draper, and Dochez. These are (1) type without paralysis, (2) cerebral type with spastic paralysis, and (3) bulbo-spinal, with flaccid paralysis.

Plague.

This disease has been known for centuries, and exists in three distinct forms, the bubonic, pneumonic and septicœmic. Bacillus pestis was discovered by Kitasato in 1894. Plague is a disease of rats, ground squirrels and other rodents. It is transmitted by the bite of the flea or by direct contact from one animal to another. The flea infects in a peculiar manner. After feeding on an infected individual it discharges the germs through the intestinal tract. These are deposited on the skin and usually scratched into the tissues. Flies, ants and bedbugs may also transmit the bacillus. The plague bacillus can penetrate the intact skin. In all probability the flea injects bacilli when it bites. The prevention of this disease is entirely a matter of rat elimination, proper isolation of the infected persons and disinfection of all discharges. Haffkine has used a vaccine in the prevention of plague with satisfactory results.

The discovery of plague-infected rats as well as the recognition of human cases at New Orleans, San Francisco, and in several other cities of the United States already emphasizes the great importance of proper quarantine. This will become even more important when immigration to this country increases after the present European war.

Septic Sore Throat.

This disease has been recognized only recently, having been confused with acute tonsilitis, or angina of scarlet fever and diphtheria. Its onset is sudden, with headache, backache, and high fever. The tonsils are inflamed and covered by an exudate forming a false membrane. This membrane can be easily removed with a swab. Complications, as peritonsillar abscess and adenitis, are quite common. The disease is produced by the streptococcus and transmitted in milk. Epidemics have been reported in Chicago, Baltimore, and Boston. The milk supply should be carefully investigated in finding the cause of these cases of septic sore throat.

Tonsillar Infections.

I have for several years been interested in the relationship of local infections such as tonsilitis to the production of systemic disease. Having been fortunate in working with Dr. E. C. Rosenow, of the Memorial Institute, who has done such brilliant work on the diseases produced by the streptococcus and pneumococcus, I have been specially interested in the tonsil as a source of infection.

Regarding the function of the tonsil, little is known. We understand that it is composed of lymphoid tissue, and normally should act as a filter for

bacteria entering the upper respiratory and alimentary tracts. That the tonsil becomes infected early in life has been demonstrated by the fact that within two weeks after birth there appear large numbers of plasma cells in the tonsil. These plasma cells can be demonstrated in the tonsils of all infants and adults. They indicate the presence of microörganisms in this tissue. That the tonsil should contain bacteria is, of course, evident as the organisms which are present in the throat become lodged in the crypts and remain there. These are in the normal tonsil relatively harmless. When an organism of increased virulence gains its way into the tonsil, there may result the formation of abscesses, or the organism may pass through the lymphoid tissue and gain entrance to the circulating blood.

Of the diseases which gain their entrance to the body by way of the tonsils, we have the following chief examples: Acute arthritis, arthritis deformans, tuberculosis, chorea, appendicitis, gastric ulcer, and, perhaps, also Hodgkin's disease, goitre, scarlet fever, measles, etc. The work of Rosenow has demonstrated the close relationship of the streptococcus group of organisms to the pneumococcus. He has been able to transform the one type of organism into the other by changing the conditions under which they are cultivated. This work is very suggestive of the possibility that many of the infections produced by the streptococcus and pneumococcus group originate from tonsillar or other localized infection. The organism producing a pathological condition in a locality of the body changes its biological properties. For example, a streptococcus growing on the heart valves acquires certain cultural characteristics which differ from a streptococcus growing in the joints, in the appendix, or in a gastric ulcer. These changes may be due to differences in the oxygen tension or the food supply to these areas.

The close relationship of acute tonsilitis to arthritis, chorea, and endocarditis has been recognized for some time. In fact, a short time ago I isolated from a tonsillar abscess a streptococcus which, when inoculated into a dog, produced the characteristic symptoms of chorea in this animal. That arthritis deformans is produced by the streptococcus can be demonstrated by the fact that this organism can be isolated from the local lymph glands, and, furthermore, vaccines made from these glands are of considerable value in the treatment of some of these cases. The streptococcus has long been recognized as the cause of acute rheumatism, and this disease can be reproduced experimentally in the rabbit and other animals by injection of the streptococcus.

The discovery in the lymph glands of Hodgkin's disease of a diphtheroid bacillus, named by Bunting the Corynebacterium Hodgkini, suggests the possibility that Hodgkin's disease may be an acute infection of the cervical glands of the neck occurring through the tonsil. The presence of this organism in a large percentage of the cases of Hodgkin's disease, and the fact that Bunting has been able to reproduce the characteristic pathologic

changes in the cervical glands of the monkey by inoculation of this organism, suggest that the organism may be the cause of this disease.

We have for a long time considered that tuberculosis of the apex of the lung may occur from tonsillar infection, for we know that the tubercle bacillus can enter through an intact mucous membrane, and furthermore tuberculosis of the tonsils is not uncommon. The tubercle bacillus may enter through the tonsils and produce changes in a remote part of the body. Beebe has suggested the possibility that goitre may be an infection produced by some unknown organism which enters through the tonsil. Work along this line is being carried out and the results are not yet conclusive. The tonsil may contain the virus of scarlet fever in an individual suffering from this disease. Extracts of the tonsil in these cases as well as scrapings from the surface will produce the disease when injected into the monkey. Furthermore, complement fixation can be demonstrated with an extract of the cervical glands using the blood of a scarlet fever patient.

We have evidence that toxic substances are produced in the tonsil—substances of a peptone nature. Extracts of tonsils containing the hemolytic streptococcus are especially toxic and produce symptoms very similar to those of anaphylaxis. They cause a marked drop in blood pressure when injected into the dog. These substances may be responsible for the marked anæmia which we find in some patients suffering with acute or chronic tonsilitis.

The above brief review will indicate to every physician the importance of removal of the tonsils when they show evidence of disease, and here I wish to emphasize the fact that a tonsil may be diseased without being enlarged. I have seen tonsils of normal size which contain small abscesses from which I have cultivated a pure culture of hemolytic streptococcus. The removal of the tonsils should not be carried out during an acute attack of tonsilitis, as there is some danger of dissemination of the bacteria with serious results. We have in the tonsil a good example of an organ whose function it is to protect the body against the invasion of bacteria, but which very often acts as a storehouse for bacteria and disseminates them throughout the body. Time will not permit mention of the other local infections which may be the source of arthritis and the other diseases produced by the streptococcus. Infections of the roots of the teeth, infections of the gall bladder, chronic appendicitis, infections of the sinuses, or chronic otitis media, etc., may produce an arthritis or a toxic neuritis in a very similar manner.

The drug treatment of these streptococcus infections is not very satisfactory. We know that the synthetic salicylates are as valuable in the treatment of these conditions as the natural product. But neither of these has any specific action toward the streptococcus. They undoubtedly relieve the symptoms, but the treatment consists in removing the local source of infection, thus preventing serious

complications, and the use of autogenous vaccines whenever indicated.

Diphtheria.

The bacteriology of this disease is well known to all. The most important recent advances in our knowledge of this disease concern the diagnosis and treatment. The recent discovery of a local cutaneous reaction by Schick will be of considerable value in determining the susceptibility of individuals to the disease. The Schick test consists of the injection of a minute quantity of diphtheria toxin (1/50 M. L. D. dose) intracutaneously. If a local reaction occurs, then the individual's blood does not contain sufficient antitoxin to neutralize the toxin injected. In other words, the individual has no immunity, or is susceptible to the infection. Individuals who are immune, either as a result of a recent attack of the disease, or the passive immunization with antitoxin, give no reaction. Diphtheria carriers, persons who harbor virulent diphtheria germs in the throat but themselves present no symptoms, also give a negative Schick reaction. We have here the explanation of the development of such carriers. They are individuals who have become actively immunized[1] against the effects of the toxin by the formation of antitoxin in the blood, but they harbor living diphtheria germs in the throat or nose.

This simple Schick test is therefore of considerable value in determining:

1. Who shall be given antitoxin in an epidemic of diphtheria (people with positive reaction),

2. Locating diphtheria carriers who are produced about every case of diphtheria (people with negative reaction but with germs in the throat),

3. Duration of immunity produced by antitoxin injection (usually only 1 to 2 months).

In connection with the antitoxin treatment it should be emphasized that in severe cases large doses should be given intravenously to obtain the best results. The antitoxin should be given as early as possible. As a prophylactic measure the value of antitoxin is unquestionable.

The problem of the "diphtheria carrier" is a difficult one. No diphtheria patient should be released from quarantine until two negative cultures taken two days apart are obtained. Giving of antitoxin does not prevent a person from becoming a carrier. The antitoxin neutralizes the toxin but does not kill the bacteria. To eliminate the carrier state many procedures have been tried, among them vaccination with killed diphtheria bacilli and spraying with Staph. aureus cultures. Sprays of $\frac{1}{4}$ to 1 per cent. of formalin have been recommended. Even more recently, Hektœn has found that kaolin, when sprayed on the mucous membranes, causes rapid disappearance of the diphtheria bacilli.

Hodgkin's Disease.

The work of Reed and Longcope has shown that this disease is independent of tuberculosis. Of late years Hodgkin's disease, or malignant lymphoma,

[1] It has been estimated that an individual giving a negative reaction has at least 1/30 unit of antitoxin per c.c. of blood.

has been regarded as of infectious nature. In 1900 Frænkel and Much reported the presence of non-acid-fast tubercle bacilli in the glands in Hodgkin's disease. This was followed in 1913 by the successful cultivation by Negri and Mieremet of an organism belonging to the diphtheria group and resembling the one described by Frænkel and Much. This work has been followed by the results of Bunting and Yates who have verified the above findings. The organism is a pleomorphic diphtheroid organism, gram positive, non-acid-fast. Bunting has suggested the name Coryne-bacterium Hodgkini for this organism. The presence of the organism in the lymph glands and the fact that Bunting has recently reproduced the characteristic changes in the cervical glands of the monkey with a pure culture suggest that it may be the cause of the disease. I have recently isolated this pseudo-diphtheroid organism in pure culture from a very rapidly progressing case of Hodgkin's disease, and used a vaccine from the organism. We can hope for a specific treatment in the disease in the near future, and a knowledge of its mode of entrance into the human body.

However, the presence of pseudo-diphtheroid organisms as saprophytic bacteria on mucous membranes, their demonstration in lymphatic glands in various pathological conditions as well as in apparently normal glands, and the great variations in their cultural characteristics make the cause of Hodgkin's disease still uncertain.

Time will not permit me to discuss the great advances in our knowledge of tuberculosis, pneumonia, tetanus, syphilis, and the other infectious diseases, as well as pellagra[1] which may be an infection. The recent work of Maude Slye on the importance of heredity as a predisposing cause of cancer, the demonstration that the tendency to cancer is a transmissible character, is of great interest and importance. Whether cancer is infectious remains to be determined, although the above-mentioned work renders this very unlikely. Our knowledge of the leukæmias and anæmias is still very incomplete. Some of these may be of an infectious nature. Proper treatment, as well as preventive measures, are dependent upon the discovery of their cause.

From the brief summary which I have presented it is evident that definite progress is being made in our knowledge of the infectious diseases, but we have failed to make use of much of this knowledge in prevention. The foundations have been laid for the science of preventive medicine. Let us help to make the structure the greatest monument contributed by the human race.

[1] Goldberger has just demonstrated that Pellagra can be produced experimentally in the human subject by a restricted diet.

TESTS OF A NEW PROCESS OF SEWAGE PURIFICATION WITH GREASE RECOVERY AND APPARENT PROFIT.

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The title of this paper well describes the scope of an important contribution to our rapidly advancing knowledge of sewage disposal.

IN JANUARY, 1915, at the Massachusetts Institute of Technology, in an address before officers and students of the Biological Department, Mr. E. S. Dorr, a graduate of the Institute and an engineer, described experiments which had been made from 1911 to 1914, under his direction at the Calf Pasture pumping station of the Boston Main Drainage works, to determine the feasibility of a process of sewage treatment, invented and patented by Mr. George W. Miles, Ph. B., a Boston chemist. This process may be described as follows:

Ordinary sewage sludge from settling basins is greasy and offensive, and of so little practical value that farmers will not accept it for fertilizer, even as a gift, yet sewage sludge contains fertilizing elements of great value and considerable grease. The Miles process attempts, by the addition of an acid, to precipitate the bulk of the solids from sewage in the form of a sludge which can be dried and degreased, thereby producing a readily salable and greaseless fertilizer, as well as recovering the valuable grease. Either sulfuric acid or sulfurous acid may be used and the process contemplates the manufacture of the acid at the disposal works. If sulfuric acid were chosen, ordinary weak chamber acid of 1.53 specific gravity would be used, but the cheapest source of acid is undoubtedly pyrite (native FeS_2), which when roasted in a furnace of proper construction, produces sulfur dioxid (SO_2). This is a gas which may be fed directly into the sewage, in which it would dissolve, forming sulfurous acid.

The addition of sulfur dioxid precipitates most of the grease, together with the greater part of the suspended matter. The resulting sludge is dried, extracted with a solvent to recover the grease and the remainder prepared for fertilizer. An important sanitary feature of the treatment is that the sulfur dioxid is a strong disinfectant, so that the acidified sewage contains few bacteria. It also contains but little suspended matter. Consequently the supernatant liquid may be discharged into a body of water like Boston Harbor without producing any nuisance.

Mr. Dorr's Experiments.—Experiments conducted by Mr. Dorr and other officers of the Sewer Division of the City of Boston were made at

different times between June 20, 1911, and June 29, 1914. Their results as reported to us are given below. In all, eleven runs were made at different times during the four years covered by the experiments, and 25,986 gallons of sewage were treated. From these experiments, Mr. Dorr concluded that he could obtain from 1,000,000 gallons of sewage 1,738 lbs. of dry sludge containing 21.7 per cent. of grease, which at 4 cents a pound would yield $15.08 per million gallons. In addition, there would be 1,361 lbs. of fertilizer base produced per 1,000,000 gallons of sewage, which was estimated by him according to agricultural standards to be worth $13.59 a ton, or $9.25 per million gallons, making the total value of the recoverable materials about $24.33 per million gallons.

In the following table are summarized the results of Mr. Dorr's experiments:

MR. DORR'S EXPERIMENTS, BOSTON MAIN DRAINAGE WORKS, 1911 TO 1914.

A. With Sulfuric Acid.	
Total sewage treated with sulfuric acid, gals	14,264
Average sewage treated per test with sulfuric acid, gals	3,566
Amount of dry sludge precipitated per million gallons, lbs	1,809
Average grease in sludge	20.31%
Average grease in sludge—pounds per million gallons sewage	393.2
Average moisture in dried sludge	5.62%
Average ammonia in sludge	3.32%
Average ammonia in sludge—pounds per million gallons	63.6
Average number of bacteria in sewage at 20° C., per c.c.	4,340,000
Average number of bacteria in sewage at 37.5° C., per c.c.	8,460,000
Average number of bacteria in effluent at 20° C., per c.c.	827
Average number of bacteria in effluent at 37.5° C., per c.c.	1,800
B. With Sulfurous Acid.	
Amount of sewage treated with sulfurous acid, gals	6,318
Average amount of sludge per million gallons, lbs	1,975
Average amount of sludge per million gallons, dry, lbs	1,814
Average grease in sludge	22.33%
Average grease in sewage—pounds per million gallons	436
Average moisture in dried sludge	8.17%
Average ammonia in sludge	3.64%

Tests by the Sanitary Research Laboratory, M. I. T.—Mr. Dorr's experiments gave results so full of promise, even though they did not touch the sludge drying and degreasing problem, that their repetition under the supervision of impartial investigators and for a longer period, was thought well worth while. Accordingly, arrangements were made with the approval of the Hon. James M. Curley, mayor of Boston, for a week's study of the process under the supervision of the Sanitary Research Laboratory of the Massachusetts Institute of Technology, and July 7, 1915, was selected as the date of beginning.

Description of Experimental Devices.—The accompanying photograph illustrates the experimental devices employed, which may be described as follows:

The devices consisted of two wooden settling tanks, a trough for mixing the acid and sewage, a supply pipe for raw sewage and devices for applying sulfur dioxid gas to the water.

The sewage was brought from the grit chamber located at the head of the

conduit leading to the Moon Island siphon, through a 1½-inch pipe leading to a barrel, in which a constant head was maintained by means of an overflow. The sewage was conveyed from the regulating barrel to a box about one foot square in plan, from which it flowed through a 1½-inch outlet pipe into the first settling tank. At a point 3 ft. 4 in. beyond the inlet of the pipe the sulfur dioxid gas was introduced. The gas was added directly to the sewage through a rubber tube leading from a tank in which liquefied gas was stored under pressure.

The treated sewage flowed through a covered wooden trough 2 ft. by 3 ft. in cross section, and fitted with baffles to insure good mixing, to the first settling tank.

Settling tank No. 1 was built of wood. It was 15.3 feet long, 3.02 feet wide and had a depth of 3.98 feet to the flow line. Its capacity was 1,352 gallons. This tank had two outlet pipes, one at the flow line and another extending 11 inches above the floor. The higher outlet connected with settling tank No. 2.

Settling tank No. 2 was of the same construction and area as tank No. 1, but its depth was only 3.61 feet, corresponding to a capacity of 1,227 gallons below the flow line. The sewage from tank No. 1 entered tank No. 2 at a point 6 inches above the bottom and escaped at the other end through a skimming overflow, discharging the treated sewage from a point about 6 inches below the surface of the tank.

Personnel.—The experiments were directed by the writer, assisted by Messrs. A. L. Gammage, C. D. Bryant and C. D. Gookin and during part of the work by L. P. Geer, T. R. Kendall and P. Masucci, with advice from time to time by Mr. Dorr and Mr. Miles. The Director of the Sanitary Research Laboratory, Prof. Wm. T. Sedgwick, has been constantly in consultation.

Methods.—The amount of sulfur dioxid gas added was determined by frequent weighings of the tank from which the gas was supplied, and by noting the acidity of the treated sewage from time to time, usually every half hour. The acidity of the treated sewage was measured at the inlet and outlet of tank No. 1 and

at the outlet of tank No. 2, respectively. It was determined by titrating with standard alkali, using methyl orange as indicator.

Description of Experiments.—Beginning at 1 p. m., July 7, a continuous test of the process was made until 3.22 p. m., July 14, when the supplies of sewage and gas were stopped, the sewage decanted from the sludge and the latter measured and dried. At the conclusion of the run, the sewage from both tanks was allowed to drain away slowly so that a settling period of over 3½ hours was given to the last sewage treated. At 7 p. m., the sewage had drained to a point 11 inches above the floor. The remaining sewage and sludge were allowed to stand until 9 a. m., July 15, and the tank was then drained through screens until all the water practicable to remove by draining had run off.

The sludge in both tanks was then well mixed and sampled, and the contents of tank No. 2 were added to tank No. 1. There were 76.5 pounds of sludge in tank No. 2 and 6,485 pounds in tank No. 1. The sludge was of a dark gray color and about as thick in consistency as would run through pipes easily. The coarser material in the sludge was deposited near the inlet end of tank No. 1.

Samples.—Twenty-four hour composite samples, made up of half-hourly samples, were taken from the raw sewage, the effluent from settling tank No. 1, and the effluent from settling tank No. 2, respectively. These samples were analyzed with the results given in the accompanying tables.

Sludge Drying Experiments.—At 3 p. m. on July 15, the mixed sludge from tank No. 1 and tank No. 2 was placed upon a cinder bed to a depth of 6 inches, and the same sludge, dried, was removed on July 22—seven days thereafter.

At 12 o'clock, noon, on July 16, mixed sludge from tank No. 1 and tank No. 2 was acidified with 0.1 per cent. of sulfuric acid (the percentage being based upon the weight of wet sludge) and placed upon a cinder bed to a depth of 3 inches; and this sludge, dried, was removed on July 19—three days thereafter.

At noon on July 16 another portion of the above mentioned acidified sewage was applied to a cinder bed to a depth of 9 inches and the dried sludge removed on July 26—ten days thereafter.

A charge of 12 gallons of the acidified, mixed sludge was dried in a steam-heated, rotary dryer furnished by the Wheeler Condenser & Engineering Company. A charge of 12 gallons was dried in an hour, and about four pounds of steam at approximately 45 pounds pressure were used to heat the dryer. The mechanism of the dryer was driven by a belt from a small vertical engine and 36 pounds of steam at approximately 45 pounds pressure were used by this engine. A second charge of 9 gallons of the same sludge was used and dried in the same way in 50 minutes, but no better results were obtained. No figures for the cost of drying were furnished or are available, because the quantity of sludge would be too small upon which to base accurate estimates.

November Experiments.—The results of the first test, in July, showed the sewage to contain a somewhat lower

fat and sludge content than appeared in the experiments made by Mr. Dorr. The reason for this was apparently an abnormal rainfall which occurred just before and during the test, namely, on the 2d and 8th of July. This resulted in a flow of sewage averaging 116,302,000 gallons per day, as shown on the accompanying plot, whereas the average annual discharge of sewage at the Calf Pasture is but slightly over 100,000,000 gallons per day.

It was accordingly thought unsafe to base final conclusions as to the correctness of Mr. Dorr's data upon the July experiments alone, and accordingly a check experiment of three days' duration was arranged to begin on November 8. This time the discharge of sewage at the Calf Pasture was found to be below the average, namely, 77,890,000 gallons daily.

The November experiments began at 3 p. m. on November 8 and continued for 72 hours, exclusive of stoppages. From 5.23 p. m. to 5.45 p. m., and 5.55 to 8.17 p. m. on November 8, the experiment was interrupted for the making of some repairs. Again on November 9 the experiment had to be stopped between 5.35 and 7.02 a. m. because the liquefied sulfur dioxid got so cold that it could not be fed from the tanks into the stream of sewage fast enough. The test was, therefore, extended for a period corresponding to the time taken out for repairs and because of lack of gas, but was brought to a conclusion at 7.11 p. m. on November 11.

On one or two occasions during the test, the effluent from the settling tank was slightly alkaline, because of insufficient gas having been added. In other respects, the experiment was conducted like that made in July.

During this test the discharge of sewage at the works was as follows:

Date.	*Gallons per Diem.*
Nov. 8	76,065,811
Nov. 9	84,120,818
Nov. 10	77,055,221
Nov. 11	74,319,242

Samples.—Samples of sewage and tank effluents were collected daily, the samples being made up of half-hourly portions like those collected in July. Samples of wet sludge were also collected, but as no sludge-drying experiments were made at this time, no samples of dried sludge were taken.

Results.—The results of analyses of daily samples of raw sewage and the effluents from tanks 1 and 2, respectively, for the seven days of the test are given on the accompanying analysis sheets. In addition to these, composite analyses were made of the daily samples collected for the first four and the last three days of the test, respectively. The composite samples were analyzed somewhat more completely than the daily samples, as the results show, and the results of analyses are given beyond.

Excess Acidity.—An excess of acid was added to the sewage at all times; otherwise the sludge would not precipitate. In general terms this excess must amount to about 10 per cent. of the total acid added. The average amounts of acid added each day, both during the July and the November experiments, are given in the following tables. These tables show that in July the effluent from tank No. 1 contained on the average an excess of 55.9 parts of SO_2 per million, and in Novem-

EXCESS ACIDITY, JULY 7–14, 1915.

Period.	Sulfur dioxid parts per million.	
	Tank No. 1 effluent.	Tank No. 2 effluent.
1st 24 hours.....	25.6	....
2d 24 hours.....	68.8	83.5
3d 24 hours.....	50.2	57.6
4th 24 hours.....	79.0	63.0
5th 24 hours.....	....	....
6th 24 hours.....	68.5	56.6
7th 24 hours.....	42.6	51.8
Average.....	55.9	62.5

EXCESS ACIDITY, NOVEMBER 8–11, 1915.

Period.	Sulfur dioxid parts per million.	
	Tank No. 1 effluent.	Tank No. 2 effluent.
1st 24 hours.....	20.7	20.7
2d 24 hours.....	17.0	12.6
3d 24 hours.....	28.6	30.4
Average.....	22.1	21.2

ber the effluent from the same tank contained an excess of only 22.1 parts of free acid per million. In July it was believed that an unnecessary excess of acid was added and consequently during the November experiments the excess was reduced as much as the rather crude apparatus for adding the acid would permit. As the result of the attempt to reduce the amount of acid in November, on two occasions the effluent from the settling tank became slightly alkaline. Nevertheless, it is believed that on an average an excess of acid not exceeding 35 parts of SO_2 per million may be used to bring about the optimum degree of sludge precipitation.

Volume of Sewage.—The following table shows the number of gallons of sewage treated daily, and also the amount of sulfur dioxid gas used daily. The table shows also the total period of subsidence in both tanks. No allowance was made for imperfect displacement in the tanks. The figures represent the capacity of the tanks in terms of hours flow. Tank No. 1 removed the bulk of the sludge, namely, about 78 per cent. of that removed by the two tanks in series.

TABLE SHOWING VOLUMES OF SEWAGE, AMOUNTS OF ACID AND PERIODS OF SUBSIDENCE, JULY 7–14, 1915.

Period.	Gallons per day.	Pounds of SO_2 gas added.	Sulfur dioxid.		Total settling period hours.
			Lbs. per million gallons.	Parts per million	
1st 24 hours	9,057	16,094	1,776	212.9	6.83
2d 24 hours	8,727	13,969	1,600	191.8	7.09
3d 24 hours	7,612	14,956	1,965	235.6	8.13
4th 24 hours	7,805	16,350	2,096	251.3	7.93
5th 24 hours	7,749	15,819	2,041	244.7	7.99
6th 24 hours	8,710	17,063	1,959	234.9	7.11
7th 24 hours	8,030	15,575	1,940	232.6	7.71
Average..	8,241	15,689	1,911	229.1	7.54

Results of Sludge Analyses.—The results of analyses of the wet sludge collected from tanks No. 1 and No. 2 during the July and November experiments, respectively, are as shown below. The weighted average result of the two experiments is as follows:

QUANTITIES AND COMPOSITION OF SLUDGE.

Moisture in wet sludge	85.80%
Fats in dried sludge (by ether)	22.66%
Pounds of wet sludge per million gallons	13,400
Tons of wet sludge per million gallons	6.720
Parts of wet sludge per million	1,612
Pounds of dry sludge per million gallons	1,909
Tons of dry sludge per million gallons	0.9545
Parts of dried sludge per million	228.9
Pounds of grease per million gallons	430.1
Tons of grease per million gallons	0.2151
Parts of grease per million (in sewage)	51.6
Average total gallons treated per 24 hours	7,890
Average pounds of sulfur dioxid used per million gallons	1,961
Average parts of sulfur dioxid per million	235.1
Average detention period—hours	7.72

RESULTS OF SLUDGE DRYING EXPERIMENTS, JULY 1915.

Sample No.	Description of sample.	Substance determined.	Percentage of substance.
3929	Sludge from Tank No. 1	Moisture	79.94
		Fats in dry sludge (by ether)	22.5
3930	Sludge from Tank No. 2	Moisture	93.88
		Fats in dry sludge (by ether)	21.5
3931	Mixed sludge from shallow depth bed—3-in. sludge	Moisture	54.99
		Fats in dry sludge (by ether)	17.5
3932	Mixed sludge from medium depth bed—6-in. sludge	Moisture	52.75
		Fats in dry sludge (by ether)	16.4
3933	Mixed sludge from steam dryer	Moisture	22.27
		Fats in dry sludge (by ether)	15.6
3955	Mixed sludge from deep bed—9-in. sludge	Moisture	60.03
		Fats in dry sludge (by ether)	15.74

Results of Sludge Drying Experiments.—The mixed sludges from tanks No. 1 and No. 2, respectively, were dried in various ways, as described above. The moisture and fat in the sludges after drying at different depths for different periods are shown in preceding table.

The sludge in the 3-inch bed and that used in the steam dryer were acidified with 0.1 per cent. of sulfuric acid before drying.

The specific gravity of the wet sludge was 1.036 and it contained only 81.6 per cent. of water at the time it was mixed and applied to beds and dryer. An unusual dryness of the sludge from this acid process is noteworthy.

Comparison of Sanitary Research Laboratory Experiments with Mr. Dorr's Experiments.—In the following table are given the results which are common to both investigations:

COMPARISON OF AVERAGE RESULTS OF TREATING SEWAGE WITH SULFUROUS ACID, AS SHOWN IN EXPERIMENTS BY E. S. DORR AND M. I. T. SANITARY RESEARCH LABORATORY, 1912–1914 AND 1915, RESPECTIVELY.

	Experiments by E. S. Dorr.	Experiments by M. I. T. San. Res. Laboratory.
Average daily flow of sewage during experiments, gallons	92,514,647	103,498,049
Average amount of dry sludge per million gallons of sewage	1,814	1,909
Average percentage of grease in dry sludge	22.33	22.66
Average amount of grease precipitated from sewage, pounds per million gallons	436	430.1
Average amount of sulfur dioxid used, in pounds per million gallons	2,300*	1,963

*Approximate.

The close agreement between the results of the two sets of experiments is remarkable. During the experiments by the Sanitary Research Laboratory a larger amount of sludge was recovered, but a smaller amount of grease per million gallons of sewage. On the other hand, the percentage of fat determined by both sets of observers was approximately the same. The mean flow of sewage during the Sanitary Research Laboratory experiments was about 11 per cent. higher than the average flow of sewage during Mr. Dorr's experiments. It may be definitely stated, therefore, that the experiments of the Sanitary Research Laboratory confirm the results obtained by Mr. Dorr regarding the amount of sludge which may be recovered from Boston sewage and the amounts of grease which are present therein.

Discussion of Results.—The Miles acid process has thus been shown to possess many advantages as a method of sewage disposal for cities like Boston, namely:

1. It disinfects the sewage by reducing the numbers of bacteria from millions to hundreds per cubic centimeter.

2. If the drying of the sludge and the extraction of the grease can be accomplished economically, it is probable that a large part if not all of the cost of the acid treatment may be met by the sale of the grease and fertilizer recovered from sewage.

3. The use of so strong a deodorizer and disinfectant as sulfur dioxid would prevent the usual nuisance of treatment works. The experiments have shown that the sludge can be held at the works for four days during the heated season without giving off offensive odors, while the effluent is inoffensive and stable enough to be discharged into Boston Harbor without the slightest probability of creating a nuisance.

4. The addition of sulfur dioxid to the sewage also avoids any fly nuisance which is a handicap to the operation of Imhoff tanks and trickling filters. This fact, with the absence of odor, would be a great advantage to any plant located at Moon Island, and would probably cause a great appreciation in value of the surrounding property.

It will be noticed that the amount of fat in the sludge, 430 pounds per million gallons, amounts to 51.7 parts per million, while the amount of fat determined in the sewage was only 36.8 parts per million. The explanation lies in the fact that the slow action of the acid decomposes the soaps which were not dissolved by ether when the raw sewage was examined. Furthermore, the samples of sewage tested did not contain a fair proportion of the large particles of fatty matter, all of which were included in the sludge. These results may be criticized as high, but the determinations have been repeated many times with practically the same result, and it is the presence of this percentage of fat in the sludge,—much larger than the amounts hitherto determined by other observers,—which, among other things, makes the proposition well worth considering for the disposal of Boston sewage. It must also be borne in mind that the acid treatment decomposes the soaps, mak-

ing it possible to recover from the sludge fats which are released from the soaps and which could not be readily extracted from the sewage were no acid used.

For large works in practice, it is proposed to produce acid by roasting pyrite (iron sulfide) which process burns out the sulfur from the pyrite with the production of sulfur dioxid. This latter would have to be dissolved from the gases issuing from the pyrite furnace by saturating part of the sewage and adding the part so treated to the remainder. For the treatment of sewage, about 1,900 pounds of sulfur dioxid would be required per million gallons.

Storage of the treated sewage in tanks would effect the removal of about 60 per cent. of the suspended matter in the form of sludge. This sludge would then have to be dried, the grease extracted by the naphtha or some other solution process and the extracted sludge sold as fertilizer base.

Economical drying of the sludge and the extraction of the grease is absolutely essential for the success of the process. Mr. Dorr's figures, which show profits of from $6.00 to $11.00 per million gallons, appear high and it is possible that Mr. Dorr has allowed too little, both for the amount of acid and for the cost of drying the sludge. For example, Mr. Dorr estimates that 1,000 pounds of sulfur dioxid would be required per million gallons of sewage, while our experiments show that the amount required would be nearer 2,000 pounds, thus raising Mr. Dorr's estimate of the cost of the acidification from $6.00 to $10.00 per million gallons. But even if Mr. Dorr's figures for acidification, drying and degreasing be doubled, that is increased from $12.00 to $24.00 per million gallons, the process is well worthy of consideration by the city of Boston because of its freedom from nuisance, and because it produces an effluent, practically free from disease germs, which can be discharged into the harbor with impunity.

Conclusion. — In conclusion, the writer would state that he finds in the Boston sewage as much sludge and as much grease as Mr. Dorr found previously. With the facts at hand, the process would be very satisfactory for Boston from a sanitary standpoint and is more promising economically than any other known. The value of Imhoff tank sludge is hardly enough to pay for the drying; at Milwaukee, Chief Engineer Hatton estimates the total value of activated sludge at from $9.00 to $15.00 a million gallons, while our Boston experiments have proved that the sludge from the Miles process, although less in bulk than that from the activated sludge process, has a value of more than $24.00 per million gallons of sewage. Correcting Mr. Dorr's estimates for the higher amounts of acid which these experiments show to be necessary, one gets $18.00 per million gallons as the average cost of treatment, and $6.00 as the margin of profit. While it is believed that this estimated margin of profit is too high, the writer is unable, by any reasonable comparison with analogous cost data from other sources, including his experience, to wipe it out. Further-

more, the large size of the Moon Island plant and the tanks already in existence there are all in favor of a reduced rather than an increased cost of treatment.

Accordingly, making every allowance which can be made with the information which the science of sewage disposal affords at the present time, the process appears still so promising from a sanitary standpoint and so attractive economically that an experiment on a large scale to settle all question of doubt has been recommended to be made by the city of Boston.

Summary of Results and Analyses.

July Experiments.

Sludge from Tank No. 1:	
Moisture	79.94%
Fats (by ether)	22.5%
(On dry sludge.)	
Sludge from Tank No. 2:	
Moisture	93.88%
Fats (by ether)	21.5%
(On dry sludge.)	
Pounds of wet sludge	648.5
Pounds of wet sludge per million gallons	11,280
Tons of wet sludge per million gallons	5.640
Parts of wet sludge per million	1,353
Percentage moisture of mixed sludge (weighted average)	81.58%
Pounds of dry sludge	119.5
Pounds of dry sludge per million gallons	2,080
Tons of dry sludge per million gallons	1.040
Parts of dry sludge per million	249.2
Percentage grease of mixed dried sludge (weighted average)	22.38%
Pounds of grease	26.73
Pounds of grease per million gallons	465.3
Tons of grease per million gallons	.2327
Parts per million of grease in sewage	55.8
Total gallons of sewage treated	57,440
Total pounds of SO_2 used	109.82 lbs.
Total pounds of wet sludge	648.5
Total detention period, hours (2 tanks)	7.54

November Experiments.

Sludge from Tanks Nos. 1 and 2:	
Moisture	92.18%
Fats (by ether)	23.08%
(On dry sludge.)	
Sludge from Tank No. 2:	
Moisture	94.77%
Fats (by ether)	24.88%
(On dry sludge.)	
Pounds of wet sludge per million gallons	18,910
Tons of wet sludge per million gallons	9.455
Parts of wet sludge per million	2,267
Pounds of dry sludge per million gallons	1,479
Tons of dry sludge per million gallons	0.739
Parts of dry sludge per million	177.3
Pounds of grease, soluble in ether, per million gallons	341.3
Tons of grease, soluble in ether, per million gallons	0.171
Parts per million of grease soluble in ether	40.91
Total gallons of sewage treated	22,720
Total pounds of SO_2 used	47.47 lbs.
Total pounds of wet sludge	429.5
Total detention period, hours (2 tanks)	8.17

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HEALTH INSURANCE.

Sickness insurance, or to give it a title more in keeping with the spirit of modern public health, health insurance is claiming a large and increasing share of public attention. The Massachusetts, New York and New Jersey legislatures have before them bills which provide for legislation dealing with this subject. The American Association for Labor Legislation has been incubating a plan for health insurance for some three years and has drafted a "model law" which is the basis of the bills now pending. This bill has been offered to certain state legislatures before but never with such strong backing as this year. At the last meeting of the Labor Legislation Association in December, 1915, health insurance was the principal theme discussed. Moreover, the report of the United States Industrial Relations Commission, which is only a few months old, urged the adoption of a scheme of compulsory health insurance not unlike that recommended by the Association for Labor Legislation.

Obviously, health insurance is another step in the process of bringing to pass a condition wherein society shall bear, distributively and immediately, the loss which must ultimately fall upon it. It is another step in the socializing process which is going on in America as surely as the years themselves.

The scheme that is now being seriously considered in three of our state legislatures and which is sure to be introduced in a number of others next year involves the following as its outstanding features:

1. Compulsory insurance for all wage earners receiving less than $1,200 per year.

2. Voluntary participation in the plan for others who so desire.

3. Benefits:

a. Medical and surgical attendance, nursing attendance for not exceeding six months in any one year and surgical supplies during the same time not over $50.

b. A cash benefit during incapacity for not more than six months in any one year and not exceeding in amount two thirds of the patient's average earnings.

c. A maternity benefit for working mothers, including professional care and a cash benefit for a period not exceeding eight weeks.

d. A funeral benefit of not more than $50.

The fund for such a system of insurance to be made up of contributions from workers, from employers and from the state. The Industrial Relations Commission recommends that the worker-beneficiary group contribute 50 per cent., the employer group 40 per cent., and the government 10 per cent. It is anticipated that the government's contribution shall be approximately such portion as is required to cover expenses of administration.

The advantage of a Federal health insurance arrangement has been strongly urged by many of those most enthusiastic. Whether or not the constitutionality of a Federal measure of this sort would be altogether free from doubt, is a question which does not appear to have received much public attention.

The obvious analogy for this sort of thing is, naturally, workmen's compensation legislation and many of the objections which are advanced against health insurance, especially those which refer to administration, can be answered by reference to the experience which some of our states have had with that institution.

An intelligent and adequate presentation of the economic loss due to sickness, a loss which falls upon the employer as well as upon the employee, will be the most powerful argument for health insurance. The immediate loss to the individual presents itself to the business man primarily as a humanitarian argument which he will at first seek to answer by reference to the existing preventive and relief agencies. A recent editorial in the *New Republic* enthusiastically endorses the plan but points out the opposition which must be overcome and the importance of making it clear that health insurance is economically worth while.

Social legislation has always had to fight its way very slowly, partly because of its neglect or inability to make clear the economic waste of permitting social wrong to continue. The business man will believe firmly enough in his workers' health when he is convinced that it is identical with the interest of his business.

Health insurance is in force in a number of countries and it works. Organized social work and organized public health are back of it here. If they can induce organized business to join with them, our ability to make it work in America is undoubted.

WHAT THE CAMPAIGN AGAINST VENEREAL DISEASE DEMANDS OF HOSPITALS AND DISPENSARIES.

MICHAEL M. DAVIS, JR., PH. D.,
Director of the Boston Dispensary.

Read before the Sociological Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

Doctor Davis presents here the relation between the dispensary clinic and hospital to our so-called medical-social problems. He does away with the conception that these clinics are "charities" and describes the work as a necessary public health service.

"FIFTEEN years ago," said Professor Irving Fisher, in an address last spring before a public health meeting, "sleeping out-of-doors branded the sleeper as a crank. Today, architects and builders find sleeping porches profitable and almost necessary adjuncts of new houses, so general is the demand for them. Public opinion on the subject of fresh air, and especially of night air, has been revolutionized. I might say that, on this matter of fresh air, we have turned upside down within little more than a decade. Yet, do you know why we are not now standing on our heads?" The audience in the city of the most cultivated traditions remained silent. "Why? Because we used to be wrong side up."

We have been wrong side up in our attitude toward venereal disease also; but we are turning over now, though not quite so fast. When the Boston Dispensary was established, just before the close of the eighteenth century, a regular rule excluded from treatment all applicants who were suffering from alcoholism or venereal disease, "inasmuch as charity should not be extended to persons who are the victims of their own sensual indulgence." It was not until about 1835 that this rule was abolished. A few weeks ago a man connected as trustee with several welfare organizations asked me what kind of cases we treated at the Boston Dispensary, and when I told him "practically all diseases," he lowered his voice and asked, "Do you treat syphilis?" "Yes, towards a thousand cases a year." "I was not quite sure," he replied, "whether you medical people felt that charitable funds ought to be used to help persons who were as wicked as that."

Whatever the campaign against venereal disease may demand of hospitals and dispensaries, it is sure to find those demands hampered chiefly by the people who see in venereal disease merely a so-called moral problem and by those other people who see nothing in it at all except something which they refuse to talk or think about. Whatever practical work we may ask of hospitals and dispensaries in helping to combat venereal disease, our broad, fundamental demand must be that they regard the matter not as a moral problem, nor as a problem to be hidden under a

blanket; but as a problem of public health, a medical problem in which social as well as scientific factors play a large part. The first demand which the campaign against venereal disease makes upon the hospital and the dispensary is that these institutions take the public health point of view, and stand ready not only to coöperate with public health officials in a passive way, but to accept the part of the public health job that properly falls to themselves and to do their part therein actively.

The hospital and the dispensary exist primarily for the treatment of disease. Are there enough hospital beds for syphilis and gonorrhea in our various communities? Are there enough and good enough out-patient clinics for these diseases? Before we can answer these questions, we must first consider other existing resources for the treatment of syphilis and gonorrhea and the relation that hospital beds and dispensary clinics should bear to these other agencies. Quality of existing facilities for diagnosis and treatment must be considered as well as quantity. These facilities, which are four, can be concretely illustrated by describing what 200 patients at the male evening genito-urinary clinic of the Boston Dispensary recently told us in response to the question, "What previous medical treatment have you had for the infection which brings you to our clinic?" These were all patients with gonorrhea. Thirty-two had had no previous treatment, these being mostly men who had come to us very soon after the onset of symptoms; 39 had been to private physicians. Most of these had left their physician because they had no more money; some because they declared the treatment to have been unsatisfactory. Twenty-four had visited other dispensaries or hospitals. Thirty-eight had been treated by quacks or advertising institutes. Sixty-seven had treated themselves with medicines purchased on the advice of drug clerks or friends. Thus, 105, or more than 50 per cent, had had no reputable medical attention. It cannot be inferred that the proportions of persons who secured these different forms of treatment would be the same if we took a series of ten thousand patients instead of two hundred. The figures do not pretend to be representative, but they are suggestive. They specify the four existing treatment facilities for syphilis and gonorrhea, namely: (1) private medical practice: (2) hospitals and dispensaries, chiefly the latter: (3) quacks, or so-called "medical institutes"; and (4) finally, treatment by patients themselves or by drug clerks. We may call this last self-treatment.

Quack treatment and self-treatment are undesirable facilities, They should be limited, and, if possible, abolished. We can diminish the amount of quack treatment considerably by prosecuting individuals and by preventing quack advertising; but while we are diminishing the amount of treatment by quacks, we must open up more of the desirable facilities for treatment and make them accessible to more people. Otherwise shutting down on the quacks will merely increase the already vast amount of self-treatment.

There remain as desirable facilities private medical practice and what we may call institutional practice—*i. e.*, hospital wards and dispensary clinics. Since there can be no doubt that the large existing amount of self-treatment and quack treatment show that the desirable facilities for caring for syphilis and gonorrhea are inadequate, we must ask the question as to whether private medical practice can be sufficiently developed to meet the needs of the mass of the population, now having these diseases and not properly cared for. The simplest answer to this question is that, despite every financial inducement, private medical practice has not and evidently will not so develop. Reasons for this I discussed in some detail in a paper presented before one of the recent sessions of the American Medical Association in San Francisco. The outstanding reason is the high cost of private practice when of good standard.

The treatment of syphilis and gonorrhea is at the best expensive, and the development of modern medical science has rendered it more so. Efficiency of diagnosis and treatment has been increased, but more resources in equipment and laboratories and more professional skill are now required. Medical science now has power to make accurate diagnosis and to provide treatment which, if pursued, will usually lead to cure, particularly if the diseases are taken in their earlier stages. But medical science has not been able to apply its power on a large scale, because the cost of its effective application, through the medium of private medical practice, is above the means of the majority of the population. Where private medical practice is adequate in quantity and quality for wage-earners suffering from syphilis or gonorrhea, it is usually too expensive; and when it is not too expensive it is likely to be inadequate.

For the mass of the population, not merely the "poor" but the self-supporting working and "middle" class, adequate facilities for treatment of venereal disease must be provided through organized medical resources. This means hospitals and dispensaries. This conclusion is not novel. It appears frequently in the bulky Report of the British Royal Commission on Venereal Disease. Increase of hospital beds and of dispensary clinics is a necessary and immediate step in the campaign against venereal disease. Public health officials, as leaders in the campaign, should demand more hospital and dispensary facilities, more accessible facilities, more efficient facilities, for diagnosing and treating syphilis and gonorrhea.

In the remainder of this paper I shall try to define what I mean by accessibility and efficiency in this connection.

I. Hospital Beds.

More beds for syphilis and gonorrhea are a present need in most communities. Such beds may better be in general hospitals than constitute a special venereal hospital by themselves. In many places, today, the local hospitals will not knowingly accept non-operative venereal cases. A survey of the number of hospital beds available in any locality for these

diseases is not difficult to make. The number of beds *needed* is a different matter. Cases of late syphilis and of complications of gonorrhea, enter hospitals under a great variety of diagnoses. Excluding these, and confining our attention to ward beds for early and infectious stages of these diseases, it must be borne in mind that the number requiring hospital isolation depends more on social conditions than on medical. The bulk of treatment for syphilis and gonorrhea in earlier stages can and should be ambulatory. Hospitals for cases whose home conditions render a period of isolation desirable, —for instance a case which, through a few doses of salvarsan, can be rendered innocuous to family and neighbors—are an urgent necessity. These considerations must be kept in mind with the constant endeavor to minimize, for reasons of economy, the number of hospital beds required, and to favor controlled ambulatory treatment, that is dispensary treatment. This is not said to underrate the importance of hospital beds for syphilis and gonorrhea, but to point out that a system of efficient dispensary clinics is a prerequisite to the proper and economical utilization of these beds. Most of the rest of this paper is devoted to the dispensary side, because, until very recently, almost no attention was paid to this highly important phase of the subject.

II. Dispensaries.

Dispensary clinics are the chief means by which adequate facilities for treating syphilis and gonorrhea are to be provided for the mass of our population. Some cities have a number of such clinics; many have none. Many such clinics have been started in connection with teaching institutions, to provide "clinical material." A great number have been established as charities, usually as parts of general out-patient departments or dispensaries. A few recently have been started as public health measures. The point of view of the medical teacher and the point of view of the benevolent giver both have their due place in connection with such clinics, but the public health point of view should be the controlling one. The test questions to be applied to such clinics are not "How many people are they treating?" but "How many are they treating *well?*"—Not "How much good is the clinic doing?" but "How efficient can its work be demonstrated to be?"

In a paper presented before the American Medical Association in 1912, I suggested methods by which the efficiency or inefficiency of the work of such clinics could be roughly tested.[1] Since then efficiency tests have been conducted at a number of institutions, notably Lakeside Hospital, Cleveland; Cornell University Dispensary, New York City, and the Boston Dispensary, Boston. Two years ago, a section of the Associated Out-Patient Clinics of New York City formulated requirements with which it was felt all clinics treating genito-urinary diseases or syphilis should conform. These requirements are of much importance. They are, however, entirely standards of equipment and certain other details,

[1] Journal of the American Medical Association, Nov. 9, 1912, page 1689.

such as forms of record. As was shown by a recent survey of the conditions of the venereal clinics in New York City (published in *Social Hygiene* for June, 1915), even these minimum standards of equipment are not met by many of the clinics in Mahattan.

Yet the standards of the Associated Out-Patient Clinics do not go far enough. We need standards of working methods as well as of equipment, and if we are to have an effective program for really efficient dispensary clinics, we must include one phase just as much as the other in our program, and just as soon. Then let us realize them all as rapidly as we reasonably can. After all, the goal is the important thing.

The Committee on Dispensary Work of the American Hospital Association, in a special report on this subject, presented at San Francisco this year, outlined briefly the working principles and methods with which efficient dispensary clinics, treating syphilis and gonorrhea, should conform. Omitting technical details, the standards of efficient dispensary clinics include the obvious requirements: (1) a medical staff sufficient in number and in special training; (2) enough well-arranged rooms, (3) equipment of instruments and apparatus; (4) laboratory service, (5) clerical and, in some cases, nursing service; (6) a card record system; also, some requirements less obvious but equally to be included, namely (7) a follow-up system; (8) social service; (9) accessibility to the persons whom such clinics ought to reach. The last three will admit of some explanation.

A Follow-up System.—This is essentially a date index of patients, dated according to the clinic day or week in which the patient is desired to return for treatment. Failure to return within the appointed period is automatically called to attention. Securing the patient's return is undertaken partly by letters, partly by social service, and especially by devoting more personal attention to him at his first and second visits. Inexpensive devices for the mechanical side of follow-up systems are extant, and such systems are now successfully maintained in a number of dispensaries. Their direct effect in promoting more continuous treatment of patients is of great value; of equal if not greater benefit is their indirect effect in stimulating the physicians and executives of the clinic to the critical study of their results and of modes of improvement.

Social Service.—Syphilis and gonorrhea are medical-social problems. Trained medical-social workers under a physician's direction are essential factors in the successful care of a considerable proportion of cases of venereal disease among both men and women. Note the following contrast. In the skin clinic at the Boston Dispensary an efficiency test was made recently for a period of six months. During this period there was no social worker in the clinic. The test showed that 27 per cent. of the syphilitic patients paid only one visit, 15 per cent. only two visits, 12 per cent. only three visits. While a certain proportion of these patients were transferred elsewhere and therefore do not count

against the clinic, it may fairly be said that in at least 50 per cent. of the cases the clinic accomplished little or nothing. The last report of the work of the syphilis clinic at the Massachusetts General Hospital to which the staff and the system were carried over from the Boston Dispensary in 1914, shows that 90 per cent. of the patients were kept under treatment and the reasons why the clinic failed to keep control of the remaining 10 per cent. were known in most cases. The comparison between the clinic without a social worker and the clinic with such coöperation is simply overwhelming.

In the autumn of 1913 the Boston Dispensary undertook a coöperative experiment with the Massachusetts Society for Sex Education. This experiment consisted in the joint engagement of a medical-social worker to serve in the Gynæcological Department of the Boston Dispensary, for the double purpose of helping patients and of studying the problems of the clinic. One of the largest of these problems is gonorrhea among women and (to a less extent) among children. Here again a transformation has been wrought. Through the establishment of a definite follow-up system, initiated by the medical-social worker in coöperation with the medical staff, and supervised by the medical-social worker, it is actually possible to get and keep control of most cases, even during the long period of treatment required by this obstinate disease. The percentage of "lost cases" drops from a large majority to a small minority of the total.

In conjunction with such work lie a host of vivid problems: the prostitute, although such are rather infrequent visitors to most clinics; the unmarried pregnant girl, a fairly frequent visitor; the school-girl who has received an innocent infection of gonorrhea; the married women whose husbands and children should be brought to the doctor for examination. Coöperation with social agencies of all kinds is another function which such a social worker serves; to stand between the doctor and the outside social worker, interpreting the medical side to the social and vice versa. Finally, such a social worker in the clinic has the unusual opportunity of dealing at first hand with the problem of sex education, to test out literature by actually "trying it on" with patients. The method and results of this work have been described elsewhere in print.[1]

Clinics for gonorrhea among men present us at once with the problem of great numbers. At the Boston Dispensary, for instance, we are treating about fifteen hundred male gonorrhea cases annually, of which about one thousand are in our morning clinic and five hundred in our evening pay clinic. Only from 12 to 18 per cent. of these patients are married men. The great bulk are unmarried, mostly men under 30 years of age, a large part under 25. With these young men there is usually no family problem which we can reach, and the young man himself can rarely be gotten at except while he is in the clinic. The vital point usually is to make him un-

[1] Boston Dispensary, 118th Annual Report, pages 39–43.

derstand the gravity of his disease, the extent and probable minimum duration of treatment, and the living conditions necessary to a cure. Thus to teach the patient is primarily the doctor's responsibility, though the social worker may coöperate with the doctor in certain selected cases. Pretty much all the work with the young men must be done while they are in the clinic.

The other great problem in a male genito-urinary clinic is the married men. In the gynæcological clinic to which I have referred, and in similar clinics at several other institutions, the social worker endeavors to bring in the husbands of the married women for examination and for treatment if they are infected. But for every woman gonorrhea patient in a dispensary we usually have four to ten men. To induce these hundreds of married men to have their wives and children secure medical examination, and, if necessary, treatment also, is a problem of social case-work, a difficult problem indeed, but one that must be attacked. In many cases the effort has been successful.

Accessibility of Dispensary Clinics.—Clinics during morning or early afternoon hours may do useful charitable service for selected sections of the population; but clinics held after the usual working hours are a necessity if the great mass of people are to find them available. The great extension of out-patient service for venereal disease must be in evening clinics. The need of evening clinics is many times voiced in the testimony before the British Royal Commission. It should be obvious to any public health officer.

Most dispensary clinics have been established as "charities." As soon as we take the public health point of view we reach a different conception. Free clinics, or clinics charging merely nominal fees (whether held day or evening), are useful and necessary for those who are below the poverty line or who earn only very small or very irregular wages. These social groups, however, are not so large as those whose members can pay something, but not enough to provide for good medical care on a private basis. Pay clinics as well as free clinics are needed. Self-supporting pay clinics, besides reaching sections of the population otherwise neglected, will help to educate the lay public to regard this work as a public health service rather than as charity.

The Boston Dispensary, I believe, started the first evening pay clinics for syphilis and gonorrhea, and has maintained them on a self-supporting basis, charging fifty cents a visit. The Brooklyn Hospital recently opened a pay genito-urinary and syphilis clinic, held between 5.00 and 6.30 p. m. An essential condition of the pay clinic should be that the medical staff be salaried. Any other policy is clearly unjust.

The desirability of pay clinics is enhanced by the fact that a very large amount of money will be required for developing an adequate clinical service for syphilis and gonorrhea. Private charity cannot possibly cope with the situation, and public funds will be appropriated only slowly. It is therefore especially desirable that private institutions, medical, charitable, or

civic, be encouraged to start pay clinics, which will naturally be held either in the evenings or late afternoons, and which will be wholly or largely self-supporting.

How far will the medical profession of a community be likely to oppose local steps in these directions? This is one of the first questions which will come to the mind of a health officer. The payment of salaries for medical service in clinics is expedient as well as just, because it helps to emphasize the view that the clinics are public health measures, aimed against prevalent contagious diseases. If we may judge by the inspiring history of the anti-tuberculosis campaign, the medical profession through its leaders and its leading organizations, will come to support any measures which are in the interest of public health, once this all-essential point has been definitely made clear. So to make it is a task for which the health officer and the social worker have especial opportunity.

Summary.

The working program presented in this paper includes the following points:

1. The present inadequate facilities for the diagnosis and treatment of syphilis and gonorrhea can be remedied only by an extension of organized medical resources, *i. e.*, by hospital beds and dispensary clinics.

2. There must be an enlargement, usually at public expense, in the number of hospital beds for syphilis and gonorrhea. Such enlargements should be made, however, after local study which leads to a definite policy as to the class of cases which are to be hospitalized, and the exact working relations between the hospital wards and the supervised ambulatory care provided by the out-patient departments.

3. Existing dispensary clinics should be brought to conform with already formulated standards of equipment and management; and their service should be periodically criticized by recognized efficiency tests.

4. Health departments or health officers should be responsible for promulgating clinical standards and for educating public opinion to insist that they be maintained in practice.

5. In a few large cities, the existing venereal-disease clinics would perhaps provide for the needs, at least in certain districts, if these clinics were organized so as to be efficient. But even in such localities a large extension in the form of evening clinics is necessary.

6. In most communities, the number of existing clinics is so small that there must be a large increase in the number of clinics, day and evening, pay and free.

7. Private organizations should be encouraged to start pay clinics on a self-supporting basis.

8. In most communities the establishment and maintenance of day and evening clinics by public funds will be ultimately necessary.

9. The provision of laboratory tests, of salvarsan and possibly of other medicines or materials, are proper forms in which public funds may assist private clinics that conform to satisfactory standards.

10. To cure and prevent syphilis

and gonorrhea as prevalent contagious diseases; to provide the necessary facilities to accomplish this purpose for the whole community: that is the point of view from which we should approach this matter. This view does not omit the moral aspects of the problem of venereal disease; it merely utilizes the physical approach as an effective avenue toward the moral goal. To drive these views home to the public in general, and to hospital and dispensary trustees, superintendents and physicians in particular, is the fundamental responsibility of the public health officer.

COMPETENT HEALTH OFFICERS.

A Coöperative Plan for Obtaining Officers Having a Given Standard of Training.

It has become increasingly apparent that if there is to be uniformity in the efficiency with which the public health functions of the state, city, county, and district are to be administered, there must be some standard for the selection of the administrative officers thereof. While many of the large colleges are offering courses leading to the degree of Doctor of Public Health, the need of whole-time health officers is so great that the number of those who possess this degree is insufficient to fill all of the vacant positions. It would seem therefore that some test of the general fitness of the physicians engaging in this comparatively new field of activity, many of whom are untrained in public health work and somewhat unfamiliar with the requirements of the position of health officer, were necessary.

The United States Public Health Service has recently been acting in coöperation with the civil service commissions of certain states and cities, and has evolved a plan which seems to be destined to aid materially in solving the problem. Upon the application of a civil service commission, or other body delegated to make the selection of health officer, the questions for the examination are prepared in the Bureau of the United States Public Health Service, and forwarded to the proper authority. The examination is given and the papers, which are submitted by number only, are returned to the board at Washington. The papers are then graded and delivered to the person making the request for the examination, or, more usually, to a civil service commission. The commission then totals the grades as they are recorded and determines how many have passed the written examination. An oral examination is also given, whenever practicable, by an officer of the Public Health Service to ascertain the experience and general fitness of the applicant. As a rule, this portion of the examination counts 25 per cent. of the total. As soon as the grades of the oral examination are completed they are forwarded to the civil service commission, which can then certify the successful candidate to the appointing authority. In this way health officers will be selected by reason of their fitness as determined by a high standard. The civil service commission or the board of health has been rendered assistance, the office has been filled by a competent officer, and the person passing the examination has the satisfaction of having been certified by the government health agency. —W. C. Rucker, Assistant Surgeon-General, U. S. P. H. Service, *Public Health Reports*, March 24.

THE MUNICIPALITY AND THE VENEREAL DISEASE PROBLEM.

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Read before the Sociological Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

"Teach the teacher to teach the parent to teach the children" is the fundamental note of this sensible diagnosis of a city's weakness.

WHATEVER a physician at fifty may know of the venereal disease problem, he is met at the outset of a discussion of it with two difficulties: if he be normal he is likely to have forgotten the appetites and desires of 25; and at any age he knows nothing whatever of woman. Therefore, in an attempt at taking stock of his city, his knowledge of the subject is bounded by the horizon of his own experiences, and acquaintance with the desires that men and women have revealed to him in the course of his professional communication with the sex who are pure, with those who have fallen, and those who, fallen, have become infected with the venereal disease. In his relation with patients he will find it difficult to believe that the whole or any larger part of the life history of the sexual appetite revealed to him in a consultation room, even in the frankest of stories, is really the whole story, or that the part of the story told to him is all true, though it may be mainly so.

Thus, any attempt to take an account of stock of the venereal disease of a city, even by the closest method at present available, is likely to lead the physician far astray; for, be it remembered, we have as yet no means of taking stock of the closer habits of life —the physical and mental disorders of the citizens of any city. While the city is presumed to exist for all the citizens, in no city do we know the total number of children born nor of the survivors do we know how many have whooping-cough, measles, scarlet fever or diphtheria; or even the carriers of any of these diseases for which a specific organism has been discovered. And, if we do not know these things, then to an outside, unbiased and intelligent observer, how can we begin to know anything of those acts and desires of men and women that in the past have been so closely linked with religion, morals and health as to make the desires and acts at one time and place sacred and at another profane; the results of these acts in disease to be visited with jeers, jokes and physical punishment, and in the case of woman, to make her and her offspring outcasts.

Now, while our knowledge of the people and their venereal diseases is very limited, yet we do know something about the problem. We are as sure that most women are pure as that many men are virgin. From the biological side we are induced to believe

that the sexual appetite of men is stronger than that of women. Of the members of both sexes we may infer that those who sexually indulge themselves outside of the bonds of marriage and who acquire venereal disease there are both directing and restraining influences. Some are, of course, venerous; others are tempted by curiosity; others succumb because of a kind of ignorance, the influence of alcohol, especially in the young man, is a factor strongly tempting indulgence. Again, on the one hand there is stupidity bordering on feeble-mindedness, and on the other as a restraining influence high mentality, great breadth of character, regard for family, and for descendants-to-be. It is the experience of some physicians that men, and sometimes women, fall because of unusual sexual appetites, alcoholic or drug indulgence, and for some other reasons. And, even after a first illicit indulgence, strong men, both physically and mentally, tempted of appetite or under the influence of first or occasional alcoholic excess, have been known to weep with shame after a clandestine sexual indulgence.

But it must not be supposed, at least it is not the writer's experience, that sexual indulgence outside of marriage is as common as has been by some presumed. On the eve of marriage many men approach their medical advisors or married friends for knowledge of the marriage relation. From this and other facts there is evidence of a more tender regard for things sexual; even the common language has changed. Many of the habits of our forefathers would today be vulgar in the extreme; their expressions if now used would border on obscenity; and all this change in the common language appears to show a desire to explain simply, though none the less clearly, some of the known things concerning the origin of life, its growth and birth in animals as well as man.

From our limited knowledge of this subject we are, therefore, to conclude that for the solution of the problem of the prevention of venereal disease there is but one recourse, and that is education. Not altogether that education which is to begin at the change of fourteen years or sixteen or older, but that education which shall begin with the earliest lisp of the little child when it begins to ask the question of the origin of its being and the uses of its external sexual organs. Here the mother must be the teacher. Teach the teacher to teach the parent to teach the children. Our mothers can be taught to teach their daughters, and our fathers must not only teach their sons, but they must act the part themselves. As for those of us in public life who are brought face to face with the problems of the city and its disease, we must so influence our citizens that one day there will be a real audit of human life for the promotion of health and the prevention of disease.

The diagnosis of the situation being difficult, its treatment is beset with difficulties. As we know very little of the problem itself, we are to assume that of the milder cases of venereal infection that occur, but a small percentage get to the well-qualified physician. Patients with venereal disease usually keep the knowledge of the

infection to themselves, if possible. Only among the more intelligent of the well-to-do are the services of a well-qualified physician secured. Even among the wage-earner and the very poor, medical or dispensary aid is not always obtained. Even when the services of an intelligent and well-equipped physician is secured, many patients only remain under treatment during the acute stages of the disease, and do not permit a sufficient length of time to elapse that subsequent contact infections may be prevented. The occasional case that goes to a physician or dispensary does not always continue treatment until recovery, and, so far as is known among private cases, no attempt is made worthy of the name to locate the source of the infection and to prevent its spread. This statement will also apply to those patients who are so unfortunate as to get either "quack" or drug-store treatments or advice from friends. Thus far, as we view the problem, the treatment of venereal disease by the municipality, considering the time in which we live, is not very different from its treatment in the old city of Toulouse 250 years ago, when the state and the university licensed the houses of prostitution and received the proceeds into their treasuries. There, when patients with venereal disease were received into the hospital, they were scourged when they went into it, castigated when they left it, and their treatment was of no benefit whatsoever. We, of course, no longer license houses of prostitution. No city with any respect for itself or its morals, even permits the existence of such a public menace. All enlightened cities have abolished such places. But all cities have clandestine prostitution, and it is with this problem and the veneral diseases resulting therefrom that the municipality in the future will be compelled to deal. What, then, are we to do to correct these errors? As has been already said, we must have educators educated for the people and for the physician as well. The red plague or the scarlet sin is no longer to be made a subject for jokes. We have learned that its consequences are too serious to be treated in any light manner. We must have a new public attitude toward infectious diseases. And this includes all infectious diseases, venereal diseases as well. In the past we have judged people, and consigned them to punishment because of the infection of venereal disease as if the punishment in the disease itself was insufficient. Who are we that we should judge the victim of venereal disease, innocent or guilty? How do we know why a man or woman acquires a disease which in one social state is a vice, in another a woeful accident of marriage? And if we are to constitute ourselves as judges, how many among us can say "I never had an infectious disease; I never sinned," or "I was never tempted?" And if I never sinned, was it only accident or design and not self-restraint that I did not? Therefore, if we cannot condone the iniquity, let us at least treat the patient as a man or woman and not deny him treatment and abuse him with the cruelty of a beast.

It is, then, education first. And while we are providing for education

we will have to secure free information in simple form for all those interested in or infected by venereal diseases. They must know not only the dangers *to* themselves, but also those dangers *of* themselves to others. We must, too, have adequate simple reports of cases, in the beginning without name or address, but giving such facts as age, sex, social condition, source of infection. And to each infected person a pamphlet relating to the venereal disease must be given by the physician. And for these services we must pay the physician. Free consultations and advice, diagnosis and laboratory tests must be provided for by the city, so that all infected persons may know, through their physicians, the result of the diagnosis and what progress is being made in treatment. There should be a special department of infectious disease in all hospitals or dispensaries, to which all infectious diseases should go, and the stigma of venereal disease should be removed alike for the guilty as well as for the innocent. Free hospital care must also be provided for such patients just as free hospital care is provided for other infectious diseases. In the past, the general hospitals have treated cases of evident venereal diseases as though they were the plague. They have denied them admission to the wards, and they have failed to provide adequate means for the diagnosis and treatment of venereal diseases in their dispensaries. At the same time no adequate means have been taken to discover the non-evident cases of venereal disease in the wards, such as we have every reason to believe always exist in the wards of a general hospital, thus evident cases have been refused admission while the non-evident have remained undiscovered.

The hospitals must not only change their present attitude toward venereal diseases, but if they are to be modern hospitals they must provide the very best men and the very best means for the diagnosis and treatment of patients suffering with venereal diseases, irrespective of the facts as to whether these people are innocent or guilty under the social law. Such patients are a menace to the public health, and it is folly to talk about isolating whooping-cough and scarlet fever when we permit gonorrhea and syphilis to run at large. In every case, private or public, sources of infection must be carefully traced, and, where necessary, free diagnosis and treatment furnished by the city. If the patient is unwilling to accept such treatment, arrest and confinement must follow. Visiting and follow-up work must be instituted, and frequent or occasional visits made after patients have been discharged in order that carriers of infection may be prevented.

This problem of venereal disease in the municipality is both a medical and social problem, if left unsolved, having vast possibilities for harm, not only in the transmission of infections themselves, but of the late remote consequences of these infections, such as circulatory changes and disorders of the nervous system, which may take place as a result of these infections. This problem is not to be solved until the cure and treatment of genito-urinary diseases cease to be a

matter for jest, and until the services of medical workers become both medical and social and are firmly, more intelligently and thoughtfully brought to bear upon the conquest of the problem. Then, and not until then, when the sexual appetites of men are brought under the restraint of education and training, when the feeble-minded are segregated, when alcoholism, the drug habit and the patent medicine habit become no more, will the venereal disease problem be in process of conquest; for then, they who lust after irregular sexual pleasures will be bound to make us free.

MUMPS.

"In view of the succession of brilliant discoveries which have disclosed the etiologic agents in the production of many infectious diseases, thereby paving the way for the relief and control of the harm instigated by them, there is something tantalizing in the limitations of progress which has been experienced in other instances. The infectious diseases, indeed," says the *Journal of the American Medical Association*, "still offer abundant opportunities for investigation. The rôle of bacteria as a cause of several has long been clearly understood. The responsibility of protozoa for certain other pathologic states is now better appreciated. Some undoubted infections still defy all search as to the nature of the etiologic factor; and in the case of some of these, the fact that the virus retains its infectious property, even after being passed through a fine porcelain filter, gives ground for the hypothesis that the germs here present are too minute to be recognized in the usual way with the present powers of our microscopes. Here one must deal with the so-called filterable viruses.

"Mumps is one of the highly infectious diseases; its etiology is unknown; it is always more or less present, in cities, at least, and it is liable to be epidemic at certain seasons of the year. A number of microörganisms have been described in the past as the presumable causative agents; but every serious attempt to apply to these bacteria the criteria and demonstrations which are called for, before the relation of cause and effect in disease can be regarded as proved, has failed. In 1908 Granata concluded that the virus of mumps may be of the filterable type. However, neither he nor Nicolle and Conseil, who injected bacteria-free fluid from the parotids in cases of human parotitis and obtained in animals symptoms somewhat comparable with those of mumps, really succeeded in reproducing the disease satisfactorily. Not a little interest must center, therefore, in the newest experiments in this field by Dr. Martha Wollstein at the Rockefeller Institute for Medical Research. She has succeeded in reproducing the chief organic lesions of parotitis in animals by means of filtered extracts of saliva derived from persons suffering from acute parotitis. Thus injections, into cats, of bacteria-free filtrates of the saliva have been capable of setting up a series of pathologic changes in the parotids and testicles, expressed by fever, leukocytosus, tenderness and swelling attended by definite histologic alterations. There is a greatly added significance in the further fact that the effect of the injection is intensified by successive transfers of the inoculated organs from animal to animal through several passages.

"It is almost needless to add, at a time when the importance of adequate control of such significant findings is obviously imperative, that the effects attributed to the saliva from patients with parotitis did not follow the injection of filtrates prepared from the saliva of healthy persons. The active agent present in the infectious saliva was found to be neutralized or in some way rendered ineffective by the serum of an animal that had survived the injection of testicular and parotid emulsions, while the serum of a normal animal had no such power. Here, then, is a phenomenon surprisingly like others that are now familiar in the experience of immunology in infectious diseases. Doctor Wollstein remarks that in all these manifestations obviously ordinary bacteria can be excluded as the active agent, since they were never found in microscopic preparations of the 'filtrate,' or in aërobic or anaërobic tissue cultures or in sections of the inoculated parotid and testes. Under these circumstances it seems reasonable to suppose that the active agent is of living nature, thus suggesting the existence here of a minute filterable virus. As a corollary to this, the power of prevention exercised by the serum may be assumed to be due to an immune substance developed in the inoculated animals. This is an approach, at least, to the determination of the specific microbic cause of parotitis or mumps in man."

THE SEWAGE PROBLEM IN SMALL TOWNS.

PAUL HANSEN,
Chief Engineer, State Board of Health of Illinois.

Read before the Section of Public Health Officials, American Public Health Association, Rochester, N. Y., September 7, 1915.

The small town, large enough to need a system of sewerage but small enough so that the expense per individual installation is greater than in large cities, presents one of the acute problems of sanitary engineering. Mr. Hansen discusses some of the means employed to dispose of the wastes of small communities.

ONE of the most troublesome problems that confronts the small community is how to get rid of liquid household wastes called sewage. The advantages of plumbing throughout the household are being more and more recognized and even in communities of only a few hundred population plumbing will be found in many residences and in the schoolhouse. All this tends to greatly increase the volume of sewage that must be disposed of. Leaching cesspools and sewage cisterns are never satisfactory—the former constitute a serious menace to wells and the latter must be emptied periodically which is expensive.

The next resort is the installation of field tile drains or the utilization of existing tile drains originally intended for removing storm water. Generally ordinances require that the coarser solid matters be removed by the householder in some form of tank; a septic tank, it is most always called, a device variously conceived in various minds, but most people are deluded into the belief that any tank called a septic tank will in some mysterious way completely purify sewage. The liquid in the drains whether passed through tanks or not soon becomes very foul and causes trouble by backing into cellars during storms or by leaching into the ground and polluting wells. Nuisances also develop in the watercourses into which the drains have outlets and at surface water inlets. Such nuisances are frequently the cause of very bitter complaint.

The situation is apt to be further aggravated by the installation of a public water supply which greatly promotes the use of plumbing and this in turn greatly increases the volume of sewage to be disposed of. This statement should not be construed as a discouragement of the installation of public water supplies. On the contrary one cannot too highly estimate the value of a public water supply to any community of 500 population or over as a protection against fire, as a household convenience, for beautifying lawns and parks, as a means to greater cleanliness, but most of all as a great factor in the promotion of public health providing the source of supply is pure.

To return to a consideration of the increased sewage produced by a public

water supply: At this point in the progress of a community that has any civic pride whatsoever, the demand for more adequate removal and disposal of sewage becomes very insistent but the desire to solve the problem cheaply often leads into error, not only in failing to secure an adequate solution of the problem but more often in gross lack of economy when the matter is viewed broadly and in the long run. It is the object of this article to point out the most common pitfalls and to recommend a rational procedure in connection with sewerage installations.

First of all, it must be realized that the only adequate solution is a well-planned system of sewers covering the entire community. Not that the entire system need be built at once, but it should be planned before any construction is begun. A line of sewers here and a line of sewers there only leads to complications which are costly to rectify. Such a policy permitted to continue for any length of time means many sewer outlets with as many stenches to correspond. Treatment of the sewage to render it inoffensive at each of the numerous outlets is hopelessly impracticable and intercepting sewers for the purpose of carrying the sewage to a single outfall can only be built at great cost, relatively speaking, and the results are rarely satisfactory.

The danger of permitting even one of these promiscuously laid sewers to be installed is a very great one, for it gives to a few people sewerage facilities that are satisfactory to them but most unsatisfactory to the remainder of the community and the few who are satisfied become most active opponents of any project looking toward the rational solution of the sewerage problem as a whole and their opposition is liable to be decisive if the improvement must be installed by special assessment.

Most small communities are on or near very small streams often without any summer flow at all so that sewage cannot be discharged into them without creating a gross nuisance. Many times, because of remoteness from habitations or because the streams are not used for any purpose such as public water supply, manufacturing, cattle watering, boating and fishing, no complaint is made and the nuisance is permitted to continue. But with increasing size of the communities and an increasing use of the waters of the streams, sewage treatment sooner or later becomes necessary and every community, excepting those on very large streams, should so plan its sewerage system that sewage treatment may be carried out in a simple, effective and economical manner whenever circumstances require.

The system of sewers which, with very few exceptions, is best adapted to meet the necessity of purifying the sewage is the so-called separate system as distinguished from the so-called combined system. The separate system is also decidedly the more economical in small communities with reasonably good natural drainage. The important feature of this system is that it provides for the removal of domestic sewage and other putrescible wastes in one set of conduits and the relatively clean storm water run-off in

another set of conduits. The laterals in the system for removing domestic wastes may be as small as six inches in diameter while the main outfall in small communities need rarely exceed eighteen inches in diameter. With the domestic sewage properly cared for, the storm water may be discharged through short conduits of larger size and laid at comparatively shallow depths into the nearest available water course. Usually storm-water drains need not be installed until street paving is undertaken, thus making the expense a gradual one.

As to methods of final disposal: Where the flow in the stream which is to receive the sewage exceeds five cubic feet per second per 1,000 persons using the sewers, the crude sewage may be discharged directly without producing a nuisance, though some care is required in the design of the outfall to insure a good mixture of the sewage with the water of the stream.

If the minimum stream flow is below five cubic feet per second and over three cubic feet per second per 1,000 persons using the sewers, then some form of fine screening or treatment in tanks is necessary. As fine screening cannot be readily applied excepting on a rather large scale, the small community is practically confined to the use of tanks.

There are three principal forms of tanks now in use, namely, plain sedimentation tanks, septic tanks and double-deck or Emscher tanks. The first is now seldom used in small installations because it involves a troublesome sludge removal problem. Septic tanks have gained a very strong hold on the popular mind as a means of sewage treatment and they are very widely used though often incorrectly and unintelligently. They overcome in a measure the sludge problem but are apt to be malodorous and to produce an inferior effluent. The two-story or Emscher tank is the one now most generally favored by sanitary engineers because it produces a fresh, well-settled effluent yet provides for complete retention and thorough digestion of the sludge.

Where the dilution available is less than three cubic feet per second per 1,000 population tributary to the sewers, some form of filtration, in addition to sedimentation, is necessary. The principal devices used are intermittent sand filters, contact beds and sprinkling filters. The limits of this article do not permit of giving a description of these devices or even stating the work they may each be counted upon to perform. Suffice it to say that the selection of a suitable device depends very much upon local conditions and is generally a matter for expert decision.

Many small communities flounder about badly in undertaking the installation of a sewerage system and in closing this paper a brief statement will be made as to the correct procedure.

First of all secure the services of a competent engineer especially versed in sewerage design and construction and if sewage treatment is necessary it is often desirable to employ a specialist in this line. A specialist in sewage treatment is generally necessary for preliminary investigations and the preparation of plans and specifications,

while the laying out and construction of the system may be intrusted to the city engineer if there is one.

The engineer should be first instructed to draw up preliminary plans, an approximate estimate of cost and a descriptive report, all of which should be submitted to and receive the approval of the proper state authorities. In practically all states where such control is exercised it is vested in the State Board of Health.

Upon favorable action by the state authorities, the project may be submitted to a vote of the people, generally a necessary preliminary to the issuance of bonds.

Following a favorable vote of the people, the engineer should be instructed to prepare detailed plans and specifications as a basis for spreading assessments (for such portions as are to be built by special assessment) and as a basis for receiving bids and awarding contracts.

Before advertising for bids or entering upon the special assessment procedure, the detail plans should again be submitted to the state authorities for final endorsement.

During construction, the city should maintain constantly on the work, one or more competent engineer inspectors, and finally, when the system is completed, the authorities should make ample provision for proper upkeep and operation especially if sewage treatment works are included. Sewers and sewage treatment works will not maintain themselves.

TUBERCULOSIS DEATH-RATE DECLINES 25% IN TEN YEARS.

While the latest report of the Bureau of the Census shows that in 1914 tuberculosis caused over 10.5 per cent. of all deaths in the registration area of the United States, the National Association for the Study and Prevention of Tuberculosis points out in a statement issued today that the death-rate from this disease is steadily decreasing, having declined from 200.7 per 100,000 population in 1904 to 146.8 in 1914. This would indicate, the association claims, that the anti-tuberculosis movement organized in the last ten years is having a marked effect on the mortality of tuberculosis, especially since the death-rate from this disease seems to be declining more rapidly than the general death-rate from all causes.

Commenting on this decrease in the rate from tuberculosis, the Bureau of the Census says: "As a result of a more general understanding of the laws of health, the importance of fresh air, etc., due in part, no doubt, to the efforts of the various societies for the prevention of tuberculosis, there has been a most marked and gratifying decrease during recent years in the mortality from this scourge of civilization. In only a decade—from 1904 to 1914—the death-rate from tuberculosis in all its forms fell from 200.7 to 146.8 per 100,000, the decline being continuous from year to year. This is a drop of more than 25 per cent."

As an indication of the growth of the campaign against tuberculosis, the National Association for the Study and Prevention of Tuberculosis shows that in 1905, when the campaign was definitely started, there were in the United States only thirty-nine anti-tuberculosis associations, 115 sanatoria and hospitals, twenty special clinics, no open air schools, and not more than 5,000 people actively interested in the prevention of this disease. At the close of the year 1915 there were over 1,500 anti-tuberculosis associations, 600 sanatoria and hospitals, 450 dispensaries, 800 open air schools, and over 100,000 people actively interested in the prevention of tuberculosis. Besides this, the fundamental truths that tuberculosis is a communicable, preventable and curable disease have been carried into almost every village and hamlet and to millions of men, women and children in a great variety of ways.

DISINFECTION AS A FACTOR IN THE CONTROL OF COMMUNICABLE DISEASES.

B. F. KNAUSE, M. D.,
New York City Health Department.

Read before a General Session of the American Public Health Association, September 10, 1915.

Dr. B. F. Knause of the New York City Health Department here discusses the various types of disinfection as tested out in New York City, and compares terminal cleansing and terminal fumigation.

THE value of disinfection as a factor in the control of communicable diseases rests upon its power to destroy the infective agents and in this way prevent the occurrence of later cases. In order to determine its worth it is necessary to consider the manner in which infection takes place, the period of greatest infectivity as judged by a study of later cases, and the ability to control the number of later cases by disinfection. The methods used are numerous and, as their relative values have been discussed at length in text-books, it is not the intent of this paper to review the same.

In the spread of communicable diseases it is necessary that a susceptible be brought in contact with the infective agent either directly as in diphtheria, or through an intermediary host, as in yellow fever. The administrative control of communicable diseases depends upon ability to maintain the two important and closely allied functions of isolation and disinfection, and the latter may be classified for purpose of study into mediary and terminal disinfection.

Mediary disinfection, that occurring during the course of the disease, is of great value. Few will doubt that the spread of disease is prevented by the proper disinfection of sputum in open cases of tuberculosis, the stools of typhoid fever patients, or the secretions from the mouth and nose of a case of diphtheria as examples. A working classification and a description of the means to be employed is found in an excellent monograph by Dr. Hermann Biggs, Commissioner, New York State Department of Health, entitled: "The Conduct of An Isolation Period for Communicable Diseases in the Home."

The performance of mediary disinfection will, as at the present time, depend upon the attending physician to a large degree until appropriations provide sufficient field-workers to properly supervise cases of infectious disease. Under present conditions the busy practitioner presumes that the family or unskilled attendants are familiar with the details of disinfection and fails to emphasize the same, and the instructions given are of oral character and soon forgotten. In New York City circulars or hanging cards giving explicit instructions are delivered by the field-workers or in the minor diseases mailed to address of family.

That an insufficient number of field-workers is provided to supervise the observance of these instructions is shown in a recent study of scarlet fever cases in Brooklyn. Out of 1,610 cases, 1,000 of which occurred in tenement houses, only 157 were supervision cases.

Mediary disinfection may be made more formidable by education of the laity and the family physician, as well, to appreciate its value. The physician must be taught to make use of his prerogative or permit the field-worker to give instructions. A complaint to the Health Commissioner by a Brooklyn physician that a field nurse was interfering and instructing his patient showed upon investigation a lack of isolation and disinfection which would justify forced removal to hospital; and the nurse had been guilty of insisting that the instructions on the hanging card be obeyed. This physician stated that he considered himself competent to attend to his patient and did not desire to have any nurse "butting in"—yet he had ignored all precautions. Another physician objected strenuously to advice given by the field nurse that a scarlet fever patient, whose quarantine period had expired, should be given a bath and clean clothes before leaving the apartment. He objected to the bath because he feared that patient might develop a nephritic condition. These cases are cited to emphasize the peculiar position of the field nurse—subject to criticism for an attempt to obey orders and censured if the orders are not enforced. These conditions must be remedied if mediary disinfection is to occupy its proper place as a marked factor in the control of communicable diseases.

Terminal disinfection may be performed by cleaning, renovation or fumigation.

Cleaning and renovation are desirable from the sanitary view, and are performed by tenant or landlord without cost to the city. In cases of tuberculosis, renovation should be enforced as a preventive measure.

Fumigation in contrast to cleaning and renovation is too costly a procedure to perform without reasonable proof of its value. During the year 1913, 29,900 fumigations of 46,762 rooms requiring 83,524 units of fumigation were performed in the city of New York. The cost of material was $14,208.20, and the salaries of disinfectors, approximately $38,550; a total of $52,758.20. The approximate cost of labor alone based on 3,232 fumigations in the Borough of Brooklyn is 85 cents per fumigation. The cost of material was $9\frac{1}{2}$ cents per M. cubic feet. The estimate of the year 1913 is submitted because of its accuracy due to the fixed price of potassium permanganate which was obtainable at the price of 17–$18\frac{1}{2}$ per kilo, while in 1914–1915 it ranged from 70 cents to $1.60 for the same amount. The method employed was as follows: For a room of 1,000 cubic feet, 1 oz. of para formaldehyde and $2\frac{1}{4}$ oz. of permanganate potash were thoroughly mixed with 3 oz. of water; all doors, windows and outlets being sealed, the room was exposed to the moist vapor for at least four hours.

As to the efficiency of this method, later comment will be made.

A comparative study to estimate the value of fumigation was made in New York City during the first five months of the present year. In the Boroughs of Manhattan, Bronx, Queens and Richmond, fumigations by the Department of Health were discontinued, while in the Borough of Brooklyn terminal fumigations were performed in all cases of scarlet fever and in those cases of dipththeria which were terminated by death or removal to hospital. A record of original as well as later cases was kept in each of the boroughs and is shown in Table 1. This table of later cases

TABLE 1.

SCARLET FEVER.

	No fumigations.				Fumigations.	
	Manhattan.	Bronx.	Queens.	Richmond.	Total.	Brooklyn.
Original cases	3,331	950	522	92	4,895	2,206
Later cases ..	263	118	78	16	475	156
Percentage ..	7.8	12.4	14.9	17.3	9.7	7.07

includes all cases occurring before and after termination of the original case. The incubation period of scarlet fever being accepted as one to five days, cases appearing within this period from the time that fumigation was or would have been performed may have been due to infection previous to termination and not preventable by fumigation. Based on this premise, Table 2 shows the subdivision of later cases into two classes:

TABLE 2

LATER CASES.

	Manhattan.	Bronx.	Queens.	Richmond.	Total.	Brooklyn.
Class A.....	229	101	76	16	422	134
Percentage.....	6.8	10.6	14.5	17.3	8.6	6.08
Class B.....	34	17	2	0	53	22
Percentage	1.02	1.78	.38	.00	1.08	.99

Class A.—Those cases occurring before five days from the date when fumigation was or would have been performed.

Class B.—Cases occurring subsequent to this date.

The comparison between the Boroughs of Manhattan and Brooklyn is of greatest interest, because of more similar conditions of population and sanitation. Class A shows a difference in favor of Brooklyn of .72 per cent. which would indicate either fewer susceptibles or more perfect mediary disinfection.

Class B, which is the essential part in the estimation of the value of terminal fumigation, shows a difference of .03 per cent. in favor of Brooklyn with fumigation, over the Borough of Manhattan without fumigation. Taking the average of all the boroughs in which there was no fumigation and comparing it to Brooklyn where fumigation was performed, there is a difference of .09 per cent. in favor of Brooklyn. Based upon this percentage, out of 4,895 cases, it might have been possible to prevent four of the later cases if fumigation had been performed throughout the city, provided of course that the efficacy of

fumigation was in itself responsible for the difference in percentage. Statistics of this kind vary, as shown in a previous count of scarlet fever cases in Brooklyn. One thousand six hundred and ten cases in the year 1914 showed only 70 later cases as compared to 156 later cases in the 2,206 cases in 1915, the total number of later cases being 226 out of 3,816 cases.

The onset of these later cases bears upon the relative value of mediary and terminal disinfection as evidenced by the fact that 194 cases or 85.8 occurred before the quarantine period of 30 days had expired. Taking a date five days from termination of the original case, the statistics of 1915 show that out of 631 later cases in all boroughs, 556, or 88 per cent., were subject to mediary, and 75, or 12 per cent., subject to terminal disinfection. The responsibility of the Department of Health for the control of any case of infectious disease dates from the receipt of the original report from the attending physician. Supervision begins at the time first visit is made and premises are placarded. A large proportion of the later cases appearing within the incubation period from the date of placarding are not subject to control by any administrative procedure. These cases should not be included in the mediary class and it is of interest to ascertain their ratio. A study of 200 later cases occurring in Brooklyn Borough shows that 104 cases or 52 per cent. occurred within 5 days from the date of placarding. This percentage is very high and it is doubtful if it would be borne out by a study of a larger number of cases. A table showing approximately the relative values of later cases subject to disinfection would be as follows:

	Per cent.
Not subject to disinfection	40
Subject to mediary disinfection	45
Subject to terminal disinfection	15

During the year 1913 terminal fumigation was enforced in all cases of measles occurring in the Borough of Brooklyn and the number of reported cases was 9,425 as compared to 8,346 reported cases in 1914 with no terminal fumigation. The value of disinfection in preventing the spread of measles is questionable. The studies of Anderson and Goldberger show that the infection in this disease is essentially a contact infection due to minute droplets and that the infectivity is marked in the pre-ruptive stage before the diagnosis has been established and while children are at school. Many cases are unreported and return to school before the cessation of the catarrhal symptoms and isolation at home in a large proportion of cases is imperfect so that sources of infection are constantly present and the number of cases dependent really upon the number of susceptibles.

Attention is called to the chart showing the number of cases in Brooklyn for the past ten years which bears evidence to this fact.

In certain of the communicable diseases where the infective agent and method of transmission are known, terminal disinfection is an admission that either mediary disinfection has been inefficient or that the case has not been terminated by scientific procedure; for example, in diphtheria, if Klebs Loeffler bacilli are present

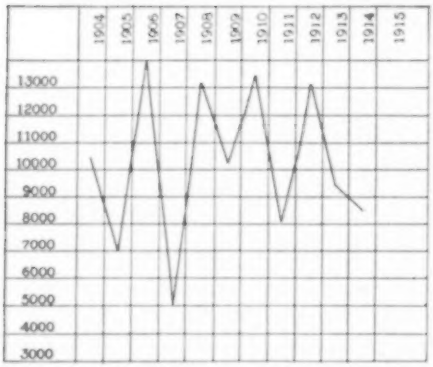

Chart showing yearly incidence of Measles in Borough of Brooklyn.

in the throat, the case should not be terminated and any disinfection would result in a false sense of security and the spreading of infection. If repeated negative cultures show no bacilli are present, it seems reasonable to expect that those which have escaped the process of mediary disinfection have become so attenuated by sunlight, diffuse light or lack of proper supporting media as to be no longer pathogenic. The lack of terminal bacteriological examination of the stools in typhoid fever is another evidence of improper termination.

In the control of smallpox, mediary and terminal disinfection are factors but they would be of slight importance if the community were properly vaccinated. The immunizing of persons exposed to diphtheria and typhoid fever, the destruction of vermin in typhus fever, of rats in bubonic plague, all tend to minimize the value of disinfection in these diseases.

The ability of formaldehyde fumigation as performed in the city of New York to destroy bacteria is very doubtful or negative. This is not of sufficient importance to justify discussion inasmuch as proper isolation, careful mediary disinfection, scientific termination, followed by cleaning or renovation, would so reduce or eliminate the number of cases now subject to terminal fumigation that the efficiency of any method of fumigation would be of little moment.

It is difficult to estimate the psychological value to the public of fumigation, but superstition should yield the right of way to scientific knowledge. The marked interest and criticism which mark any change in a belief in any long established procedure should offer vast opportunities for educational purposes through the medium of the daily press.

To summarize:

(1) There is a certain proportion of cases over which there is no administrative control.

(2) Mediary disinfection is a most important factor, neglected both by the attending physician and Department of Health, entitled to much greater attention and strict supervision.

(3) Terminal disinfection by cleaning and renovation are desirable from a psychological and sanitary view, and in certain diseases, like tuberculosis, renovation should be strictly enforced.

(4) Terminal fumigation is a costly procedure, the method and reliability have no weight, as the necessity for a procedure of this kind is an admission of improper isolation, imperfect mediary disinfection or improper termination. As a factor in the control of communicable diseases it is of negative value.

COMMISSION SUPERVISION OF INDUSTRIAL HYGIENE.

WALLACE D. YAPLE,
Chairman, The Industrial Commission of Ohio.

Read before the Industrial Hygiene Section, American Public Health Association, Rochester, N. Y., September 10, 1915.

Ohio has taken a leading place in the sanitary and hygienic phases of industrial life. The Industrial Commission and the State Board of Health are in coöperation in their efforts along this line.

THE subject of industrial hygiene is one that is now receiving the earnest attention and consideration, not only of medical men and experts but of those most directly and vitally concerned, viz., the employers and employees of the country.

It has not been many years since employers, as a class, were utterly unable to appreciate the economic value of hygienic working conditions of their employees, and the employees themselves were loth to coöperate with their employers in such isolated instances as attempts were made by them to promulgate and enforce rules and regulations having for their object the creation of hygienic working conditions.

The enactment of workmen's compensation laws, which place upon the employer the burden of compensating employees sustaining injury in the course of their employment, in practically all of the industrial states of the union has been the means, more than any other one thing, of awakening in the minds of employers the importance of industrial safety and hygiene, and it is becoming to be generally recognized that, viewed solely from an economic standpoint, it means a saving in dollars to have working conditions approach as nearly as possible the ideal.

The importance of industrial hygiene being conceded, the important question is as to the methods to be adopted in securing it. For reasons which are manifest the subject is one which cannot be left to the judgment and discretion of individuals, and therefore, the police power of the state should be invoked to secure general and uniform observance of what are ascertained to be hygienically correct principles.

Should this be done by the enactment of specific laws by the legislative authorities of the several states whereby the duty of complying with certain definite and specific requirements of the law is imposed upon the employer? Or, should the legislative authority simply lay down the broad and unqualified rule that all employments and places of employment shall be safe and sanitary and delegate to some agency of government the duty of ascertaining what conditions and appliances are safe and sanitary, and executing and enforcing the law accordingly?

Aside from a question of constitu-

tional law which is involved, the problem is a practical one, and is merely that of the most effective method of attaining the desired results. Under our system of state government the powers of the state are delegated powers. No inherent powers are possessed by it and the powers exercised by the executive, legislative and judicial branches of the government must be exercised each in its proper sphere. The powers of one branch must not encroach upon those of any of the others, and the powers of one cannot be delegated to those chosen to perform the others. While the principle is elementary that legislative power must be exercised by the legislative branch of the government only, and cannot be delegated to any of the other branches, in practice it is often a matter of great difficulty to determine whether the doing of a particular thing is an exercise of legislative or executive power. But it seems to be well settled that there is no objection to the delegation of legislative functions which are administrative or executive in character, to departments of government created by the legislative power, and that there is a wide difference between a delegation of the power to *make the law* and a grant of authority relative to its *execution*. It follows that, where the legislative body has established a general rule of law, it is competent for it to create a board or commission or other agency clothed with power and authority to adopt rules and regulations by means of which the law itself is made effective. The granting by the law-making power to city councils and boards of health of the right to make local ordinances and orders respecting the public health and well-being, and the granting to boards and commissions the right to determine and establish fair and equitable rates to be charged by railroads and other public service corporations, are illustrative of the apparent exceptions to the principle of non-delegation of legislative powers.

Prior to the year 1913 the method in vogue in Ohio was that of specific legislation. In 1913, following the example set by Wisconsin, the General Assembly of Ohio passed an act creating The Industrial Commission of Ohio, the commission thus created being not only charged with the duty of administering and enforcing the general laws of the state for the protection of the life, health, safety and welfare of employees and places of employment (all of which were left in full force and effect), but also being clothed with the power and authority to ascertain and fix such reasonable standards, and to provide, modify and enforce such reasonable orders for adoption of safety devices, safeguards and other means and methods of protection, to be as nearly uniform as possible, as may be necessary to carry out all laws and lawful orders relative to the protection of the life, health, safety and welfare of employees and places of employment. That the commission may fully exercise its functions, it is given jurisdiction over all employments and places of employment within the state. So, as matters now stand, Ohio has such specific statutory provisions relative to in-

dustrial hygiene, as were in force prior to the passage of the industrial commission act, supplemented by the general requirements and broad powers of supervision and enforcement contained in that act.

The act provides, in substance, that every employer shall furnish employment which shall be safe for the employees therein, and shall furnish a place of employment which shall be safe for the employees therein, and shall furnish and use safety devices and safeguards and shall adopt and use methods and processes and follow orders, and shall prescribe hours of labor reasonably adequate to render such employment and places of employment safe, and shall do every other thing reasonably necessary to protect the life, health, safety and welfare of such employees. The words "safe" and "safety," as applied to any employment or place of employment, are defined to be "such freedom from danger to the life, *health*, safety or welfare of employees . . . as the nature of the employment will reasonably permit, including requirements as to the hours of labor with relation to the health and welfare of employees."

One of the duties especially enjoined upon the commission is to investigate, ascertain, inquire and prescribe what hours of labor, safety devices, safeguards, or methods of protection are best adapted to render the employees of every employment and place of employment, and frequenters of every place of employment, safe, and to establish and maintain museums of safety and hygiene, to ascertain and fix such reasonable standards and to prescribe, modify and enforce such reasonable orders for the adoption of safety devices and safeguards and other means or methods of protection as may be necessary to carry out all laws and lawful orders relative to the protection of the life, health, safety and welfare of employees.

The commission is granted plenary power with reference of making investigations for the purpose of ascertaining facts, and employers are required to furnish it with all information required by it to carry into effect the various duties imposed upon it, and any member of the commission or any of its duly authorized deputies may enter any place of employment for the purpose of collecting facts and statistics relative to the health, safety and welfare of employees therein, and for the purpose of ascertaining any failure on the part of the employer to comply with the laws of the state or the orders of the commission with reference to the preservation of the health and safety of employees.

Thus it will be seen that the General Assembly has laid down a broad, general requirement that all employments and places of employment must be safe and sanitary, with the qualification that nothing unreasonable shall be required. In other words, the requirement is that all employments and places of employment shall be as free from danger to the health and safety of the employees *as the nature of the employment will reasonably permit.*

When the commission has ascer-

tained what should be the standards of safety and hygiene, it is its duty to formulate "orders" embodying its requirements. Such orders are "general" and "special." A "general" order is one that applies generally throughout the state, to all persons, employments or places of employment of a class under the jurisdiction of the commission. A "special" order is one which applies to a particular individual or particular place of employment, and is designed to secure the observance either of a statute or of a general order theretofore duly made and promulgated by the commission. All general orders must be published, but it is sufficient to print them in pamphlet form for distribution to those who apply for them.

The commission is authorized and empowered to appoint advisors, who shall, without compensation, assist in the execution of its duties, and this provision is of very practical importance, as it enables the commission to call to its assistance men possessing ripe experience and judgment and special knowledge on the subjects of industrial safety and hygiene. In selecting such committees for the purpose of making investigations and formulating orders on the subject of industrial safety and hygiene, the commission has had no difficulty in procuring the services of the most prominent men in the state from the ranks of both employers and employees. Inasmuch as all specific laws on the subject of industrial safety and hygiene were left in full force when the industrial commission act was passed, the commission has not acted hastily in exercising its broad powers, but has proceeded deliberately and cautiously. A number of advisory committees have been at work for more than a year and all will report, at an early date, the result of their investigations, along with their recommendations as to what general orders should be adopted and promulgated by the commission. No doubt the commission will adopt the recommendations made with little, if any change.

One of the most important advisory committees designated by the Industrial Commission to assist it in formulating hygienic orders is one consisting of the executive officer and the members of the division of occupational diseases of the State Board of Health. At the same session of the General Assembly at which the industrial commission act was passed, the State Board of Health was authorized to make an investigation of the "effect of occupations upon the health of those engaged therein with special reference to dust and dangerous chemicals and gases, to insufficient ventilation and lighting, and to such other unhygienic conditions as in the opinion of said board may be specially injurious to health." The investigation so authorized was conducted, and a report thereof made under the direction of Dr. E. F. McCampbell, Executive Officer and Dr. Emery R. Hayhurst, Director, Division of Occupational Diseases of the State Board of Health, and, without doubt, it is the most thorough and complete of any similar effort yet made in this country. The purpose of this investigation was to

secure accurate information as to industrial diseases and their causes, in order that measures might be adopted preventing them, as far as possible, and that provision might be made for compensating their victims. By availing itself of the services of those who made this most valuable investigation and report, the Industrial Commission hopes to be able to formulate such reasonable and necessary general orders on the subject of industrial hygiene, as will result in much benefit to the individuals engaged in the occupations in which they occur, and to the general public.

The Industrial Commission of Ohio has not made sufficient progress to warrant the unqualified statement that questions of industrial safety and hygiene should be left solely to the judgment and discretion of the commission, but enough has been accomplished to justify the belief that the plan now being followed will, in time, eliminate most of the well recognized health hazards from industry. One of the most hopeful signs is the spirit of coöperation between employers, employees, and the state authorities that has resulted from the appointment of "advisory committees." These committees are composed of leading employers, employees and physicians of the state. When their recommendations are adopted by the commission and become "general orders" it is obvious that much of the difficulty of securing law observance on the part of employers will have disappeared, for employers have themselves suggested the standards to be observed after first having determined their reasonableness.

Under the old plan of specific legislation only, with no officer or commission specifically designated to enforce the laws, law enforcement was left largely to local authorities, and the result was that nowhere was there strict enforcement, and the rule was lax enforcement or non-enforcement. Under the new plan, with well recognized standards of safety and hygiene embodied in specific statutes, supplemented by the general requirement that all places of employment shall be as safe and sanitary as the nature of the employment will reasonably permit, with authority vested in the Industrial Commission to ascertain correct standards and adopt and promulgate general orders for the observance of those engaged in the various industrial pursuits, the state, through its commission says, in effect, to employers and employees: "The state is desirous of eliminating health hazards from industry. You are the persons primarily affected by such hazards. Let us counsel together and determine what reasonable standards and requirements should be established to protect the health and lives of the more than a million men and women engaged in gainful occupations. When such standards and requirements have been ascertained, let us coöperate to secure general observance thereof, invoking the police power of the state only when necessary." By following this plan it is my opinion that more will be accomplished in a few years than could be accomplished in a decade through the instrumentality of volumes of penal statutes and an army of factory inspectors.

COLON BACTERIA AND STREPTOCOCCI AND THEIR SIGNIFICANCE IN MILK.

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STATEMENTS relating to the significance of the presence of a particular organism in milk or water are usually based on the assumption of a restricted normal habitat for the organism in question. The presence in milk of streptococci with certain characteristics is more or less conclusive evidence that the milk came from cows with infected udders. Since the habitat of the colon bacillus is the animal digestive canal, the presence of this organism in milk or water is proof of the contamination of the milk or water by fecal matter.

It is perfectly proper to ask if we have a sufficiently intimate knowledge of these two groups of bacteria to permit any positive statement as to the limits of their habitat. We may even question whether our methods of classification have been sufficiently comprehensive and, above all, sufficiently exact and accurate to enable us to distinguish between different members of what are evidently heterogenous families. The limitation of the colon bacillus to the intestine has been questioned by the work of Prescott on the occurrence of colon on grains and by Johnston who found a bacillus which could not be distinguished from colon growing in decaying buds of the palm.

Before a categorical statement can be made to the effect that the presence in milk or water of bacteria of a certain rather indefinitely defined type is more than presumptive evidence of fecal contamination we should have more detailed information not only of the bacteriology of the regions whence these bacteria come, but also of other regions whence they may come. This information can be obtained only when we have more intimate acquaintance with the various individuals making up the streptococcus and colon families.

Some of this knowledge has accumulated in the past few years. The objection will no doubt be made that the recent differentiations, particularly of the streptococci, have been based on physiological functions such as the fermentation of carbohydrates and that these characters are variable and undistinctive. The limits of this paper will not permit a discussion of this phase of the question but it may be said that the fermentative reactions are at least as constant and distinctive as the characters usually employed and that they become less variable as our methods of determination become more nearly exact. Moreover, by the intelligent use of these reactions, we obtain results which promise to bring order out of confusion.

In many laboratories the presence in milk of streptococci forming chains in lactose broth at 37° is taken as evidence that at least part of the milk came from infected udders, and sometimes as conclusive evidence of contamination with cow feces. Is the property of forming chains under these

conditions peculiar to the bacteria infecting the udder? Are these streptococci or the streptococci of the bovine digestive tract distinct varieties or are they, as some maintain, merely temporary variants from the common type? Work recently done in our laboratory, as well as similar work elsewhere, throws light on this question.

Fifty-one cultures were obtained from two herds in which there had been difficulty with infected udders. In one case the epidemic was severe. On the basis of fermentation tests it was possible to separate these cultures into two varieties, evidently related but separated by certain distinctive characters.

Nearly all cultures of both types fermented lactose, saccharose and dextrose, and failed to ferment raffinose, starch and inulin. They differed in the liquefaction of gelatin and the fermentation of mannite and glycerine which were nearly always positive in one type and negative in the other. The more numerous type, the one failing to liquefy gelatine and to ferment mannite and glycerine, had a marked but not unfailing tendency to form long chains in broth at 37°. This combination of characters may be represented by a diagram as in Figure 1.

The fermentative reactions of the pus-forming type of streptococci, generally known as Streptococcus pyogenes, have been well established by the work of Andrews and Horder, Gordon, and particularly by the results of Hopkins and Lang. All investigators agree that this type ferments dextrose, saccharose and lactose but

FIG. 1. Diagram showing the fermentation reactions of two types of udder cultures of streptococci.

almost invariably fail to ferment the higher polysaccharides, including raffinose. Apparently alcohols, as mannite and glycerine, may be fermented by occasional cultures. Accepting Hopkins and Lang's arrangement as correct, we find that the diagram for the non-liquefying udder streptococci will serve almost equally well for Streptococcus pyogenes.

A tabulation of the fermentation reactions of the 114 cultures isolated from bovine feces presents a different picture. This type is much more active both in the amount of acid produced and the number of substances fermented. Dextrose, saccharose and lactose are almost invariably fermented, raffinose almost always, and starch by about fifty per cent. of the cultures, while a comparatively small number ferment inulin. On the other hand, with the exception of a few cultures fermenting mannite, they are unable to utilize the alcohols. These results confirm those previously obtained by Winslow and Palmer[1] and Fuller and Armstrong.[2]

[1] Winslow and Palmer, Jour. Inf. Dis., 1910, 7 pl.

[2] Fuller and Armstrong, Jour. Inf. Dis. 13, No. 3, 442-462.

It may, then, be considered as established that cultures, at least those freshly isolated from pathological sources, are characterized by a weak fermentation of the simpler sugars and an inability to ferment higher polysaccharides and alcohols, while cultures from bovine feces may be distinguished by their activity in fermenting polysaccharoids and inability to attack alcohols.

How do these results correlate with the streptococcus determinations usually made in sanitary examinations of milk? A collection of 42 cultures from samples representing 25 farms were isolated by inoculating lactose bile, incubating at 37° and plating tubes showing distinct chains.

No culture was selected which did not show distinct chains.

The characteristics of this collection were not so sharply drawn as were those from the udders or from feces but, excluding two cultures which were clearly of the fecal type, we may readily divide this collection into two groups, as indicated in Figure 2. One of these is almost identical with one of the udder groups, differing principally in the percentage of gelatine liquefiers. This is a character which is generally recognized as subject to considerable variation.

Fig. 2. Diagram showing a possible grouping of the milk cultures of streptococci.

The second group has a slightly lower proportion of saccharose fermentors and a larger percentage of mannite fermentors, otherwise the resemblance is marked.

We believe that these results, while they are not conclusive, substantiate the belief that the presence in lactose bile inoculated with milk and incubated at 37° F. of streptococci forming distinct chains, is good presumptive evidence of milk from infected udders. It should be noted, however, that udders may contain streptococci of the pyogenes type without showing physical signs of infection.

Turning to the gas-forming bacteria, we find a large group of lactose-fermenting bacteria, loosely bound into a common family by certain characters and still more loosely separated into subgroups by other characters. The significance of their presence in milk is based on the assumption that their normal habitat is the digestive tract of animals, and that their presence elsewhere is *prima facie* evidence of contamination with fecal matter. In considering the validity of this assumption, we must take into account the wide limits of the strains or varieties included under the term colon group, of which all respond to the presumptive tests and many to the more discriminatory confirmative reactions. The several subgroups are not sharply defined.

It is very difficult to find in the literature any agreement on the characters peculiar to any one variety. Some put

considerable dependence on the appearance of the agar colonies but the differentiation is usually made on the basis of certain sugar fermentations. The gas volume and ratio on which the first separation was made have been practically discarded as variable and of no diagnostic value. The separation into subgroups is not ordinarily emphasized because it is believed that the entire group is of fecal origin.

We began our work on the colon group with a study of about 120 cultures from samples of milk collected in various parts of the country. All these cultures would answer the presumptive tests for colon and nearly all the usual confirmative tests. So far as it was practicable we substituted exact methods of analysis for the ordinary rough determinations of the bacteriological laboratory. The value of this change was particularly evident in the gas volume and ratio. The volume and especially the ratio of carbon dioxide to hydrogen produced under constant conditions was not only constant for individual cultures but was surprisingly uniform for groups of related cultures.

Such discrepancies as did occur became less as simpler media were employed and more nearly perfect methods of analysis developed. On the basis of the carbon dioxide ratio with which were correlated certain fermentation reactions, it was possible to separate the milk cultures into two sharply defined groups. One of these which, for convenience, we shall designate as the low-ratio group, was characterized by a carbon dioxide ratio of almost exactly 1:1. A second group possessed a higher ratio; that is, a larger amount of carbon dioxide in relation to the volume of hydrogen.

The correlation of other characters with these types of gas ratio was sufficiently marked to make the separation of the two groups clear and distinct.

This brings us to the question of the ultimate source of the two groups. Are they both normal inhabitants of the intestine and do they occur anywhere else in nature?

In an endeavor to answer the first part of this question we made a collection of 150 cultures from bovine feces.

These cultures were obtained by plating on asparagin agar at 30° and lactose gelatin at 20°, and all responded to the usual presumptive tests for colon.

The striking thing about this collection was the remarkable uniformity with which the cultures conformed to a very definite type. This is shown for the CO_2: H_2 ratio in Figure 3. Of the 150 cultures in the collection, 149 gave the 1.1 ratio which characterized about fifty per cent. of the milk cultures. One culture only gave a high ratio and one of the 149 low-ratio cultures was distinguished by the formation of a yellow pigment. The agreement between the feces organisms and the low-ratio cultures from milk is further emphasized by Figure 4. In this plot the percentage of positive results are plotted to the left of the median line and negative results to the right. The feces cultures are represented by solid lines and the milk cultures by broken lines. The entire low-ratio group is logically divided into two subgroups corresponding to coli communis and coli communior.

The almost complete absence of the

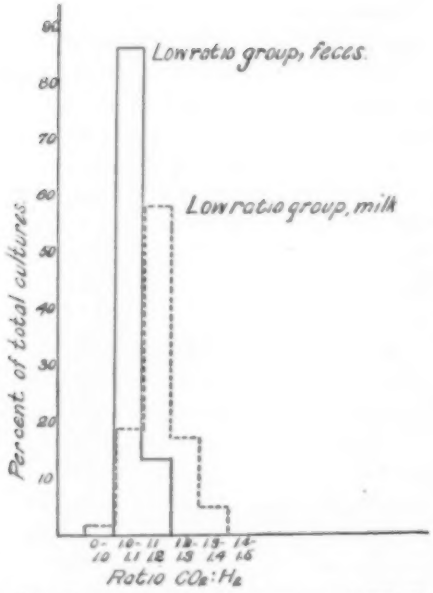


FIG. 3. Frequency of occurrence of CO_2:H_2 ratios.

high-ratio group in bovine feces was so surprising that a special effort was made to isolate additional members of this group. None of these attempts, however, gave any indication of the presence of colon-like bacteria other than those belonging to the low-ratio group, with the exception of the one culture previously mentioned.

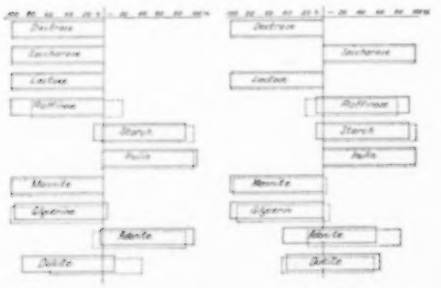


FIG. 4. Two subgroups of the low-ratio groups. Solid lines represent cultures from feces, broken lines cultures from milk.

Following the suggestion of Prescott's work on the occurrence of colon on grains we made a collection of 166 cultures from 33 samples of corn, wheat, oats and barley, kindly obtained for us by the grain standardization laboratory. There were also a few cultures obtained from green oats collected in the vicinity of Washington, with proper precautions to prevent contamination.

Nearly all these cultures responded to the presumptive tests for colon and very many would have passed the usual confirmatory tests.

Chart 5 shows that on the basis of gas ratio and volume the grain cultures may be divided into three sharply defined groups. One of these, represented by 8 cultures, has the characteristic colon ratio. A second group differs from any previously observed in that they produced carbon dioxide only, thus giving a ratio equal to infinity. The remaining cultures gave gas ratios varying from 1.90 to 2.90.

One of the peculiarities of the group was the presence of a considerable number of pigment formers. In order to make more nearly exact comparisons, a small portion of an agar culture was dried on white paper and matched with Ridgeway's standard color plates. It was found that a large proportion of the cultures showed some degree of pigment formation. However, in most cases, the amount of pigment was so small that the culture would not ordinarily be classed as a pigment former. On the other hand, some of the cultures were decidedly colored. In this class were all those mentioned as giving the colon ratio

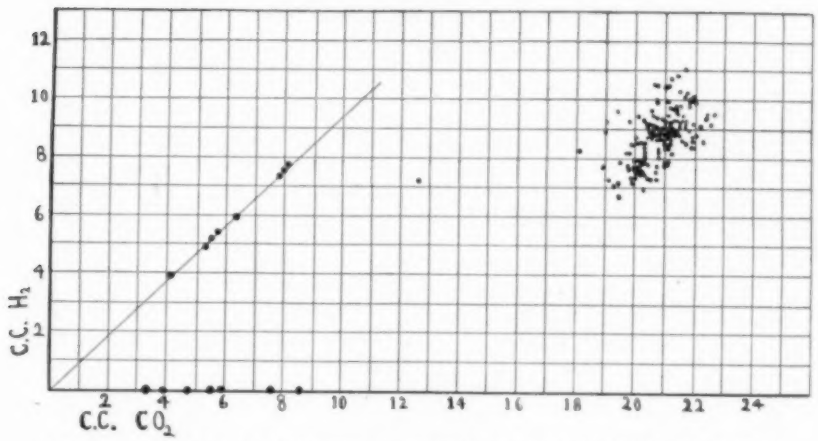


CHART 5. Showing the differences in gas-production of the "high ratio," "low ratio," and ∞ groups of bacteria of the colon-aerogenes type

of 1.1. In all cases the color was a mixture of yellow and orange, varying, however, in shade and tone from a cadmium yellow to cream color or nearly white. The 153 cultures giving a high ratio were divided into 5 tentative groups. This division was based mainly on correlated fermentation tests but there was also a correlation between these tests and the gas ratio. This is illustrated by Table I.

Without going into detail as to the method of classification we may represent the six groups into which we have divided this collection as shown in Table II. In this chart the plus sign indicates that a high percentage, usually nearly or quite 100 per cent., gave a positive reaction. In group C, which included 40 cultures, and D with 90 cultures, the uniformity of reaction was striking. The numbers of cultures in other groups are so small that they are at best only suggestions.

The work on the colon group may be summarized briefly as follows:

The bacteria of the colon type occurring in ordinary market milk may be divided into two very distinct groups, one of which agrees closely with the type found to be the characteristic colon bacillus of the bovine intestine.

The high ratio group found to be numerous in milk evidently occurs in the bovine intestine only very rarely.

The surface of dried grains is the source of a number of types of colon of which one only resembles the low-ratio feces type and this one is distinguished by its ability to form pigment. The type occurring with greatest frequency probably corresponds to the ordinary conception of B. lactis aerogenese.

However, many of the grain cultures would answer to the usual tests for B. coli communis or communior.

It is difficult to avoid the conclusion that while the presence of fecal

TABLE I.

DISTRIBUTION OF CULTURES BY PIGMENT FORMATION.

Numbers and letters in heads refer to plates in Ridgeway's Color Standards and Nomenclature.

	No pigment.	17oy.	17′oy.	17″oy.	19yoy.		19′yoy.				19″yoy.				21″yoy.	
		Cadmium yellow.	f. Light buff.	d. Pinkish buff.	b. Apricot yellow.	Light cadmium.	f. Cream color.	d. Naples yellow.	b. Mustard yellow.	Primulin yellow.	f. Cartridge buff.	b. Chamois.	Honey yellow.	i. Isabella color.	f. Ivory yellow.	d. Colonial buff.
Type A	..	..	..	..	..	..	..	..	..	..	..	1	6	1	..	..
Type B	..	2	1	2	..	..	1	..	..	1	..	..	..	..	..	..
Type C	..	..	..	..	6	20	..	..	7	7	..	..	..	..	..	..
Type D	13	..	2	..	..	..	62	1	..	..	1	..	..	..	7	1
Type E	3	..	..	..	..	..	3	..	..	..	..	..	..	..	2	..
Type F	..	..	1	..	..	..	7	..	..	..	2	..	..	..	3	..

bacteria in milk may be determined with great certainty, the ordinary presumptive tests and even the usual confirmatory tests do not necessarily prove the contamination of the milk with fecal matter.

TABLE II.

REACTIONS OF TYPE CULTURES.

	A.	B.	C.	D.	E.	F.
Ratio $\frac{CO_2}{H_2}$	1.06	∞	2.51–2.80	2.20–2.50	2.10–2.30	1.90–2.20
Pigment	Honey yellow	Cadmium yellow, pinkish buff	Light cadmium	Cream color	Cream color	Cream color
Capsule	—	—	—	—	+	+
Indol from tryptophan	*	—	—	—	+	—
Gelatin	—	+	+	—	—	—
Saccharose	—	+	+	+	+	—
Lactose	+	—	+	+	+	+
Raffinose	+	—	+	+	+	—
Starch	—	—	—	—	+	—
Inulin	—	—	—	—	*	—
Mannite	+	+	+	—	+	*
Glycerin	*	+	+	*	+	*
Adonite	*	+	—	—	+	—
Dulcite	*	—	+	—	+	—

PUBLIC HEALTH PUBLICITY: THE ART OF STIMULATING AND FOCUSING PUBLIC OPINION.

EDWARD A. MOREE,
Director, Atlantic Division, American Red Cross, formerly Assistant Secretary, New York State Charities Aid Association.

III. Making a Meeting Effective.

A LITTLE meeting is sometimes a dangerous thing. Organizing meetings to promote a cause is fraught with pitfalls and hidden dangers. With this phase of the stimulation of public health opinion, as with practically every other of the numerous phases of this new art, long experience has developed principles that no public health agitator can neglect without menacing the prestige of his cause.

An ineffective meeting is not merely a waste of energy and funds. In nine cases out of ten, it is a positive damage. Public health publicity is an effort either to change the lives and habits of the people or to focus or refocus public opinion. As a feature of public health publicity the effectiveness of a meeting must be tested by the following questions: First, Does it catch the public's attention? Second, Does it *focus* that attention sufficiently

An automobile parade will advertise your meeting.

to draw a crowd? Third, Does it move individual or mass opinion in the direction desired?

Unfortunately, some meetings attract public attention by their ineffectiveness; some instruct the masses on the wrong side of the question by emphasizing the inefficiency of the organizers. Some meetings move to action in the wrong direction by giving the impression, through a small and uninterested audience, that the movement has little public support.

I recall very vividly one extremely unfortunate experience with an ineffective meeting. One day I received a telegram that a *mass* meeting was to be held in a certain place at a certain time, to discuss the question of establishing a county tuberculosis hospital, and that I had been announced as one of the speakers. Several former experiences with mass meetings that had failed to mass made me a bit wary of this meeting. I was assured, however, that the women's clubs, the Chamber of Commerce, and the lodges and labor unions of the community were "cooperating"; that the mayor was to preside; that other city officials were very much interested and would lend their support; that the newspapers had already shown a great interest and would during the week devote large space to the meeting.

The Mass Meeting that Failed to Mass.

Now all this seemed good. A meeting with such a well-considered plan to make it effective could scarcely fail to be a valuable aid in focusing public opinion on the question of a county hospital. There were to be five speakers of local prominence including the mayor, who was to preside. The weather on the evening of the meeting could not have been better and there were no counter attractions.

The audience that appeared to hear the arguments on this very important question consisted of the five speakers, the presiding officer, the janitor and one newspaper reporter!

Unfortunately for the cause of the county tuberculosis hospital in that particular community, the newspaper reporter seized upon the opportunity to write a humorous story of the mass meeting that failed to mass (and who could blame her). This gave the supervisors of the county, who had the county hospital under consideration at that time, exactly the impression that such a failure is well calculated to convey.

It is important to note that everything that had been *planned* to make the meeting effective was done. The Chamber of Commerce passed a resolution approving the meeting; the women's clubs of the city passed resolutions approving the meeting; the labor unions and some lodges also passed resolutions; the newspapers nearly every day for a week carried stories varying from a "stickfull" to a half column. The newspaper publicity was excellent.

In this case, as with every ineffective meeting, the very volume of the newspaper publicity was one of the most damaging features of the failure. The higher you raise a public's expectations of a meeting, the greater will be the crash when they fall.

LEARN WHILE LAUGHING

FIVE FREE MOTION PICTURE SHOWS

FOR THE BENEFIT OF PUBLIC HEALTH

Under the Auspices of the City of Yonkers

COME!

YOU, YOUR FRIENDS & FAMILY ARE INVITED

(OVER)

FIRST ENTERTAINMENT

COLUMBUS PARK, Park Hill Ave. and Linden St.

Thursday evening, August 20th, at 8 p. m.

Dates of other Shows to be announced

In case of rain postponement to following evening if pleasant

See daily press for program or any change. 5

Front and reverse of an admission ticket. The Union label is important.

PUBLIC OPINION MUST BE PRECIPITATED.

The flaw in the situation was this: while a great deal of public opinion had been stirred up, it remained in solution—nothing was done to precipitate it. Public interest was stimulated but it remained unfocused. The organizers of the meeting got the same results as would a merchant who spent all of his advertising energies in instructing the public on the merits of

his goods and failed to give his address or tell the public where and when the goods would be on sale.

If the organizers of that disastrous mass meeting had distributed two or three thousand admission tickets through the women's clubs, the lodges, the Chamber of Commerce and the other organizations that "coöperated," the result of the meeting probably would have been vastly different. There would have been a sufficient audience to have furnished a reporter possessing even an ordinary journalist imagination with sufficient basis for a "large and enthusiastic audience" or at least an "audience that made up in enthusiasm what it lacked in numbers."

An organizer of a meeting owes three kinds of debts: (1) To his cause; (2) To his audience; (3) To his speakers.

Duty to the Cause.

The organizer's duty to his cause is preëminent. He must arouse public opinion by making the meeting impressive. This means not merely gathering a large crowd, but it also means providing speakers whose standing in the community will establish in the public mind the fact that the movement has the approval of people whose opinions count. If speakers from outside the community are on the program, they must be authorities on the subjects they are to discuss. It is necessary to inform the public of this

A school children's parade always attracts attention.

authority through publicity in advance of the meeting.

Providing an interesting program is a large part of the organizer's duty to his audience. He also has program responsibilities to his cause, aside from making the meeting impressive. He must provide speakers that will add to the sum total of the community's knowledge on the subject under discussion. This does not mean, always, speakers of great scientific reputation. Out of the mouths of wise men there frequently cometh forth unintelligible sound.

Another most important responsibility of a meeting organizer is to see to it that the influential people in the community, particularly public officials whose support for the cause is neces-

Four Reel Feature

"THE WHITE TERROR"

A Thrilling Silent Drama

And Also an Interesting Lesson on the

Patent Medicine Fraud

TO BE SHOWN AT

Tuberculosis Mass Meeting

Thursday Evening, November 4, 8.15 P. M.

Auditorium, Education Building,

Hawk St. Near Washington Ave.

GOVERNOR WHITMAN

Commissioner Biggs and Others

WILL SPEAK

Admission Free

This ad. in four Albany papers filled a hall with 1,000 persons in opposition to an important concert.

sary, are invited. This is so vitally important that special efforts should be made to secure their attendance. It is usually well worth while to fix the date of the meeting only after consulting the important persons in the community as to their ability to be present. Telephone reminders on the day of the meeting and providing special conveyances sometimes succeed in securing the attendance of busy persons where ordinary methods would fail.

HAMLET WITH HAMLET LEFT OUT.

I have a very vivid recollection of traveling several hundred miles to address a "mass" meeting (this also failed to mass), for the purpose of focusing public interest on the desira-

TONIGHT

"The White Terror"

Thrilling Silent Drama Based on the Death That Lurks in the

Consumption "Cure" Fraud

Governor Whitman,
Commissioner Biggs and Others
WILL SPEAK

Tuberculosis Mass Meeting

Auditorium Education Building

Hawk St., Near Washington Ave. 8:15 P. M.

Change your advertising on the day of your meeting. This followed the "Four Reel Feature" advertisement.

bility of turning over the public health nursing of the community to the Department of Health. Upon asking the chairman to introduce me to the mayor and other city officials, I discovered that not only had no special effort been made to secure the attendance of the mayor, the board of health and the aldermen, but they had not even been invited! It is little to be wondered at that the mayor and the aldermen and the other officials when called upon to appropriate funds for taking over the public health nursing of the city, failed to respond with any great degree of enthusiasm.

Duty to the Audience.

It should be possible to indict and convict of highway robbery any person who steals time from audiences by enticing them into meetings upon the promise of interesting and instructive programs which prove to be neither interesting nor instructive. Many meetings would fall under the constitutional prohibition against cruel and unusual punishment. It sometimes seems that meeting organizers not only choose their speakers with the idea of torturing as many of their fellow beings as they can entice into their meetings, but also choose their halls for the sole purpose of making the punishment inflicted by the speakers as unpleasant as possible. Nothing can be worse than listening to speakers who have nothing to say and who cannot by any possibility say it interestingly, unless it is listening to them in a hall that is so poorly ventilated that you must stick pins into yourself to keep awake, and the acoustics of which are so poor that you can't even hear the man who has nothing to say and who doesn't know how to say it. There is not a reader of this article who has not endured not one, but many such horrible experiences.

FREE! FREE! FREE!

You Are Invited to Attend a Mass Meeting at the State Armory, Sunday Afternoon

December 12, 1915 — OSWEGO'S OBSERVANCE OF — At 3 O'Clock Sharp

National Tuberculosis Sunday

→UNDER AUSPICES OF COMPANY D←

LOCAL COMMITTEE

John Dougherty, Chairman, Dr. H. S. Albertson, Capt. T. A. Ball, W. C. Brown, H. J. Cooper, John C. Henry, John H. Hourigan, Joseph J. McGrath, Richard J. Schuler.

SPEAKERS

Francis E. Cullen and Geo. J. Nelbach

Secretary State Charities Aid Association

Chorus of 100 Voices Under the Direction of Wm. C. Brown of the Oswego Milling Co. Will Sing Gounod's "Sanctus" and "To Thee, O Country"

Soloist, Charles Dehm — **Concert by Phillips' Band** — **Accompanists, Prof. Joseph J. McGrath, Richard J. Schuler**

A page paid-for advertisement drew a crowd in Oswego. Note the chorus which is advertised.

Those of us who are addicted to attending conferences, or whose jobs force attendance, either deserve what we get or must perforce endure it.

The lay public, however, has the right to expect different treatment from us than that which we force upon ourselves at county, state and national conventions.

Making up a Program.

Too often we fail to live up to our two chief responsibilities to our audience: (a) providing an interesting program and (b) providing a hall where the audience in some degree of comfort can hear and see the performance.

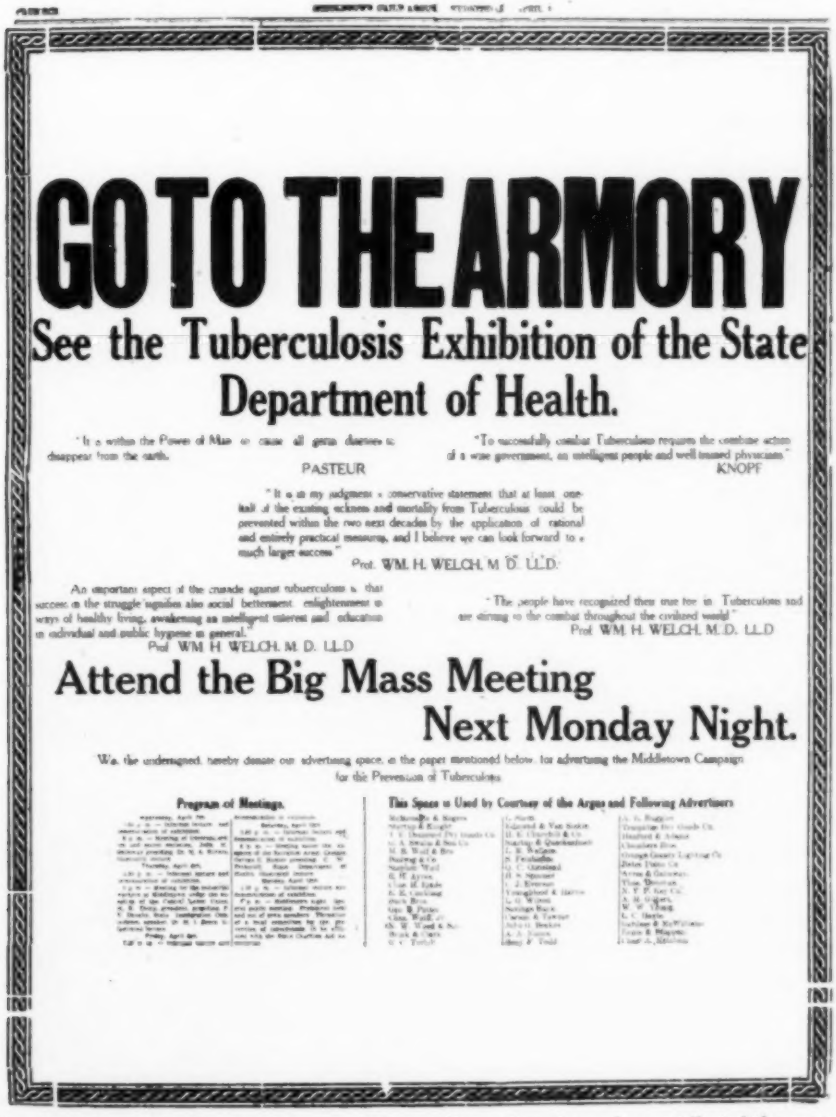
Many meetings *happen* in about this fashion: A committee is called together for the purpose of considering some phase of a public health campaign. About the first suggestion that is made is "Let's have a mass meeting." Why a meeting cannot be simply a meeting and nothing more, but must always be a "mass" meeting I have never been able to decide, but the fact remains that most meetings are "mass" meetings. I would like to organize a "disintegrated" meeting and note the result.

The suggestion for a mass meeting is immediately adopted, and then from all sides come suggestions for speakers. These are usually chosen because (a) they are prominent in the locality; (b) they are supposed to have some

An exhibit still attracts crowds that will attend your meeting if urged at the right time.

knowledge of the subject under discussion; (c) an invitation to speak will attach their interest to the cause and, (if they are politically potent) will result in increased appropriations or will otherwise aid the movement.

Every one of the above considerations in the selection of the speakers is important. The cruelty to the audience results from the fact that a speaker who is socially or politically prominent and whose influence is



GO TO THE ARMORY

See the Tuberculosis Exhibition of the State Department of Health.

"It is within the Power of Man to cause all germ diseases to disappear from the earth."
PASTEUR

"To successfully combat Tuberculosis requires the combined action of a wise government, an intelligent people and well trained physicians."
KNOPF

"It is in my judgment a conservative statement that at least one-half of the existing sickness and mortality from Tuberculosis could be prevented within the two next decades by the application of rational and entirely practical measures, and I believe we can look forward to a much larger success."
Prof. WM. H. WELCH, M. D. LL.D.

An important aspect of the crusade against tuberculosis is that success in the struggle signifies also social betterment, enlightenment in ways of healthy living, awakening an intelligent interest and education in individual and public hygiene in general."
Prof. WM. H. WELCH, M. D. LL.D

"The people have recognized their foe in Tuberculosis and are uniting in the combat throughout the civilized world."
Prof. WM. H. WELCH, M.D. LL.D

Attend the Big Mass Meeting Next Monday Night.

We, the undersigned, hereby donate our advertising space, in the paper mentioned below, for advertising the Middletown Campaign for the Prevention of Tuberculosis.

Program of Meetings.

This Space is Used by Courtesy of the Argus and Following Advertisers

A reduced page display advertisement, giving credit to advertisers who contributed the space.

needed in a campaign for an infant welfare station, for example, may know absolutely nothing about the subject he is to discuss, and may make a very unfortunate presentation of the subject, and may, furthermore, be an unutterable bore as a speaker. Then, on the other hand, a speaker who knows more or less about his subject, may be unable to express his knowledge or his opinions in a manner that will be either intelligible or interesting to laymen.

Members of a lodge attending meeting in a body.

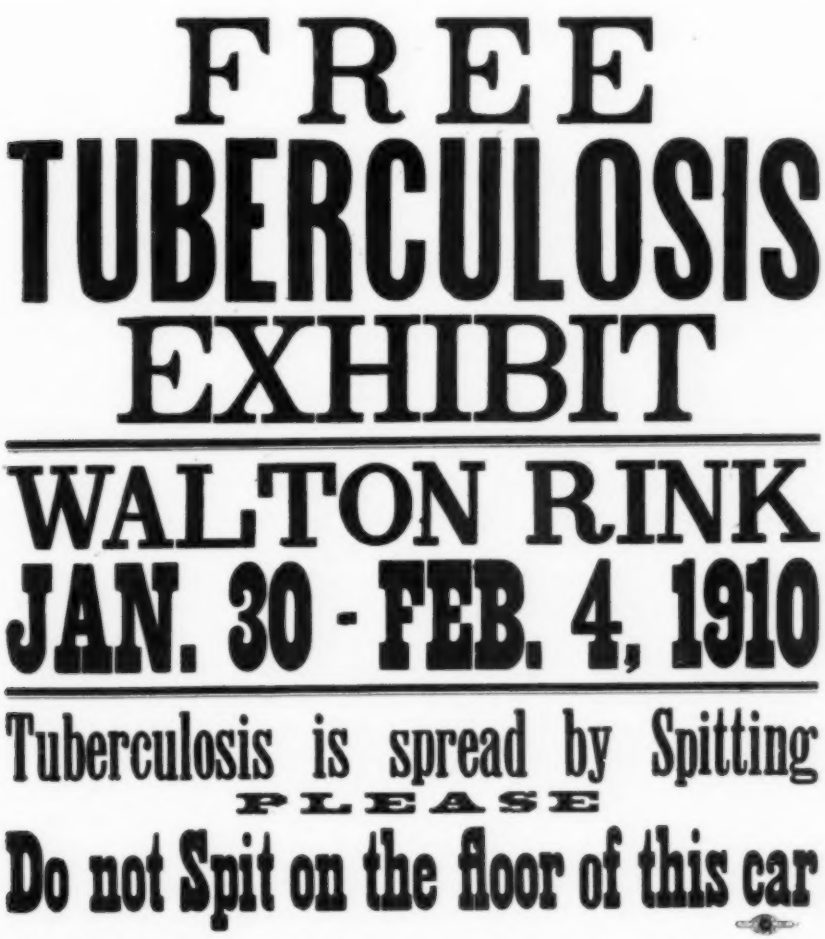
It is difficult to say which is the more important if one has to choose—impressive scientific knowledge or ability as a public speaker. The test to apply, naturally, is the capacity and requirements of the particular audience you have in mind. If you are to reach out especially for professional men you will choose your speakers with their scientific attainments particularly in mind. I have no doubt that many will disagree with me when I advise, for an audience that will be composed chiefly of laymen, sacrifices on the scientific side in order to secure speakers who have the power to interest their audiences.

Selecting a Hall.

Having brought together enough names from which to make a selection, the committee proceeds to the consideration of a hall. This is usually chosen because it is centrally located, and very little, or at the best too little

thought is given to the other important requirements for a meeting place; namely, (a) size; (b) ventilation; (c) acoustics. Every one of these considerations are important. It is dangerous, however, to consider any one to the exclusion of the others. Central location is highly important, of course, but central location obtained at the expense of proper size, ventilation and acoustics, will often do the cause more harm than good.

A centrally located hall may be many times too large for the audience. Your speakers will find themselves confronted by dismally few persons scattered over vast areas of empty seats. This is not only dampening to



A handbill for use in a street car that the car company might like to use because of the anti-spit warning.

the ardor of the speakers, but is exceedingly damaging to the cause. Even a small audience loses much of its depressing quality in a hall that fits it.

The convenience of the location of your hall may be the chief factor in bringing a large audience to your meeting. If, however, your hall is too small to hold the audience; if it is so poorly ventilated that a large portion of your audience goes to sleep; and if its acoustics are so bad that the speakers cannot be heard, your central location will prove to be a damage rather than a benefit to your cause.

People do not like to climb stairs. Any hall above the first floor is usually undesirable. A hall above the second floor should practically never be considered.

Safety in case of fire is usually given no thought at all. I have attended meetings held in second or third floor halls in buildings that were veritable fire traps. Any occurrence that might start a panic, such as a disturbance or even a small fire, would have resulted in loss of life. This may seem to be an unimportant point, but scarcely a year goes by that does not register one or more catastrophes caused by crowding large numbers of persons into halls with inadequate exits and with little or no fire protection. This should be a major consideration if a large portion of your audience is to be children.

Duty to Speakers.

In discussing the make-up of a program I did not try to minimize the difficulty of obtaining good speakers. Speakers acceptable from all important points of view who are willing to give their services and who are willing to travel long distances on a gratis mission are scarce.

One reason for this is that speakers are meeting-shy. Those of us who hunt know that it is very easy to make a good dog gun-shy. From unfortunate experiences in early youth many dogs become so afraid of a gun that even the sight of one will send them scurrying back home with their tails between their legs.

Nearly every man who is much sought after as a speaker has had experiences with mass meetings that failed to mass; with meetings of important groups that failed either to group, or be important.

One or two experiences of this kind make a speaker meeting-shy. Most invitations to speak at meetings are turned down by public men because they know of a certainty, bred of woeful experience, that if they accept they will have their trouble for their pains.

The first duty of a meeting organizer to his speakers is to provide an audience.

The next most important duty probably is that of simple, ordinary, common courtesy. This article does not intend to degenerate into a dissertation on rules of etiquette. It will achieve a worthy purpose, however, if it succeeds in implanting in the minds of meeting organizers the idea that possibly a person who travels some distance to address a meeting deserves certain attentions. Each one is small and unimportant possibly, but

they are important in the mass as adding to the speaker's comfort and increasing his value as part of a program. An associate looking over my shoulder as I write this, says: "Let us conserve our country's natural gas resource by being decent to it."

The following is a speaker's bill of rights:

1. To be given definite information as to the following points:

a. The date, hour and place of the meeting.

b. The subject he is to discuss and the length of time allotted to it.

c. The probable size of the audience.

d. The kind of audience, the names of the other speakers and some information about them and their topics.

e. The definite purpose of the meeting, in considerable detail.

f. The purpose of the whole campaign if the meeting is one of a series of events.

2. A memorandum giving detailed information on all local factors that have any relation whatever to the purpose for which the meeting is called, should be mailed the speaker as soon as possible after he has accepted the invitation to speak.

3. A memorandum should be sent him giving the hour of departure and arrival of the most important trains, both going and coming.

4. He should be relieved of the responsibility of securing hotel accommodations. (Most speakers from a distance prefer to stay at a hotel rather than to be entertained at someone's home, unless it happens to be a friend or acquaintance.)

5. He should be told whether or not to wear evening clothes.

6. If he arrives close to the hour of the meeting he should be met at the station with some sort of a conveyance. This is especially important if he happens to be a stranger to the community, and may avoid delay in the meeting.

7. Most speakers coming from a distance will appreciate also being met at the station by a member of the committee who can confer with him on the plan and purpose of the campaign, and answer the many questions that always arise in the minds of speakers who conscientiously try to "deliver the goods."

8. If the speaker is to receive his expenses or an honorarium, or both, he should be relieved of the responsibility of finding out how and when to present his account.

9. A speaker who gives his services deserves at least to have his expense account settled promptly upon the presentation of his memorandum.

10. A speaker coming from a distance at considerable sacrifice deserves to be relieved of the torture of listening to long-winded introductory remarks by the chairman and other local lights. You may feel at liberty to thus torture your friends and neighbors but it's no way to treat a stranger. It's often done but it isn't hospitable. If you must have bores on your program give your speaker a ticket of leave by telling him as nearly as possible the exact hour of his appearance.

11. Tell your chairman as tactfully

as you can that a really important speaker objects to fulsome praise. Dr. Edward T. Devine, director of the School of Philanthropy of New York, once told a story that I am going to repeat here so that long-suffering speakers may have a defense against oratorical buncombe hurled at them by well-meaning chairmen.

A district leader was called on the 'phone by a ward boss and the following conversation ensued:

"Mr. Murphy, do yez know Pat McGuire of the tent'?"

"Yes, I know him?"

"Well he's a moighty foine mon, and a shtrong party worker. Oi want yez to do all yez can fer him. Git him a job, now won't yez. He's a foine citizen."

"I'll do what I can for him, Mulligan. Your recommendation counts big with me."

A few moments later Mr. Murphy's 'phone rang again.

"Is this Murphy."

"Yes."

"This is Mulligan of the tent'. Now about M'Guire. Wot I said about him the other minit don't go, see. The dom loafer wuz settin' right here at the toime. He's a thief and a blackguard."

12. Your speakers deserve to be introduced by a person who can do it in a few words that will give the audience a definite idea as to what they have done and why they were invited to speak on that particular occasion. The organizer of the meeting should see to it that he gets the needed information from the speakers and should also see to it that it gets to the chairman of the meeting in time for him to become familiar with it. A man who is unwilling to familiar-

A poster in red and black. Contains little but says much.

Reduced from a large canvas sign to be attached to wagon sides.

ize himself with information of this kind, or who feels that a proper introduction for speakers is not important, should never be chosen as chairman of a meeting.

By-products of an Out-of-Town Speaker.

The out-of-town speaker has certain potential by-products that are very often neglected by meeting organizers. If he is sufficiently prominent and enough of an authority on the subject he is to discuss, publicity that is extremely valuable to your cause may be obtained in the newspaper articles concerning him and his work, preceding the meeting. It will probably be possible to get from him an interview on some subject akin to the one he is to discuss. Such interviews can frequently be constructed out of previous addresses or pamphlets or books that the speaker may have written.

On the day of his arrival or the day following the meeting valuable conferences may be arranged between an out-of-town speaker and important local officials or other prominent citizens whom it is desirable to interest in the cause. Frequently a luncheon conference or a private dinner preceding the meeting to which a few of the most important citizens of the community are invited, and dur-

ing which the speaker may more or less informally discuss the work in which he has acquired his reputation, or the work of other communities along similar lines, will result in greater benefit to the cause than the main purpose for which the speaker has made his journey.

Obligations of the Speaker.

No one should accept an invitation to address a meeting which has caused the organizer considerable effort unless he is willing to do everything in his power to make the meeting effective. The most important of his duties, of course, is to prepare an effective address on the subject assigned to him. Many speakers who are "full of their subject" pride themselves on their ability to deliver an extemporaneous address. This leaves them prey to circumstances which they may not be able to control. A too hearty dinner has spoiled more than one extemporaneous speech. A slight interruption at the beginning of an extemporaneous address has more than once marred the whole speech by side tracking the main thought. A cold, unresponsive audience frequently makes it impossible for a man to throw himself into his subject with the abandon that is necessary to make an effective extemporaneous address.

Even admitting extraordinary familiarity with a subject, a speaker can never guarantee to "deliver the goods" unless he takes considerable time to prepare himself. It is of course true that a speech that is read is never as effective as one delivered either extemporaneously or with very slight reference to notes.

PUBLICITY LEADS IN HEALTH WORK

NEW YORK OFFICIAL SAYS PAPERS SAVE LIVES

Declares National Newspaper Advertising Campaign Would Accomplish Tremendous Good in Fight Against Disease.

Rochester, N. Y., Sept. 9.—"Printers' ink is saving more lives than any other single agency employed by modern health workers," said E. A. Moree, assistant secretary New York State Charities Aid association, before the American Public Health association.

"Printers' ink," said he, "should be entered in the pharmacopoeia as an accredited remedy for human ills. Among other things, it prevents tuberculosis and builds hospitals to cure it; it saves the lives of children and controls epidemics of smallpox. Thousands of babies are today alive in New York state largely because big doses of printers' ink were administered to the public by the state and local departments of health. One of the most important cities of this state endured an epidemic of smallpox that increased rapidly for a whole year. Then the newly reorganized department of health announced that its policy in dealing with local epidemics would be state-wide publicity. When the people of that city realized that their health standards were to be broadcast through the pa newspapers and would c knowledge of the peop state whose lives the officials of t ed the progra

This is the result of preparing a news summary of an address and sending it to the newspapers in advance of delivery.

As between an ineffective extemporaneous speech and a less spectacular written address, however, there is no choice. The advantages are all with the latter.

This is especially true when one

considers publicity. It is always possible to get more publicity and more accurate publicity from a written paper than from one that is not. The unfeeling brutality with which the ordinary reporter deals with the oratorical efforts of the extemporaneous speaker frequently brings tears of anguish or blushes of shame to the one who leaves himself open to such mistreatment.

This brings me to the next obligation of the speaker; *i.e.*, the preparation of a short, intelligible abstract of his speech. A newspaper abstract of a speech is not a list of headings and is not a summary in the ordinary sense of the term. A reporter listening to a speech selects from the many possibilities offered, one or two important points and elaborates these into a story. A speaker will, without exception, find himself better treated in the newspapers if he adopts this plan in preparing his abstract. The abstract may be sent to the meeting organizer for such use as he cares to make of it or sent direct to the newspapers as circumstances dictate.

The torture of speakers and audiences by organizers is only equalled in brutality by the torture of organizers and chairmen by speakers who fail to confine themselves to time limits. A half hour speech that runs an hour is brigandage coupled with outrage.

If unforeseen circumstances arise, making it impossible for the speaker to keep his engagement or to keep it on time, the organizers of the meeting have the right to expect that he will inform them immediately.

Securing a Crowd.

It would be impossible in the space allotted to this article to consider in detail all the possible schemes to secure audiences. Some of the most important plans that have been tried will be described briefly.

There are so many meetings of so many different kinds that it is very difficult indeed to arouse interest in a plain meeting without attractive additional features. If the occasion is sufficiently important to secure a speaker of nation-wide fame he will no doubt prove to be the only attraction that is necessary to draw a crowd. There are very few speakers in this country, however, who can be depended upon to do this without a great deal of publicity, and without working many different plans to arouse public interest and focus it on the meeting.

Some feature, therefore, that is even more or less removed from the main purpose of the meeting is sometimes necessary. A band or an orchestra that can furnish amusement and keep up enthusiasm before the meeting and during its course is frequently a valuable aid in attracting a crowd. The Oswego (N. Y.) Tuberculosis Committee found that a chorus attracted much attention, and not only in and of itself added to the audience, but that each member of the chorus brought several friends.

Motion pictures always arouse interest. There are so many films now available that it is possible to get two or three interesting subjects that will fit well into almost any public health program. If these are used their stories should be presented in the news-

papers previous to the meeting, and will constitute a very important publicity medium.

If a large crowd is desired (and if a large crowd is the aim no reasonable effort should be spared to achieve it), it will pay well to devote a considerable sum of money to publicity. There is no way of securing publicity more effective than employing a newspaper man on part time to prepare articles for all of the papers and to see to it that they get to the papers at the proper time and in the form that the newspapers will find most convenient for their use.

Aside from the publicity in the news columns, paid-for space will nearly always produce satisfactory results. It is a serious mistake to spend a large sum of money in hiring a hall and for the other expenses incident to organizing a large meeting, and then fail to secure a crowd through economy in publicity and other efforts to focus the public's attention on the meeting.

An interesting scheme which proved successful in getting the right kind of an audience for a public meeting was tried recently in Indianapolis by Dr. C. N. Hurty, secretary of the State Board of Health of Indiana.

Doctor Hurty was organizing a public health mass meeting in a hall that

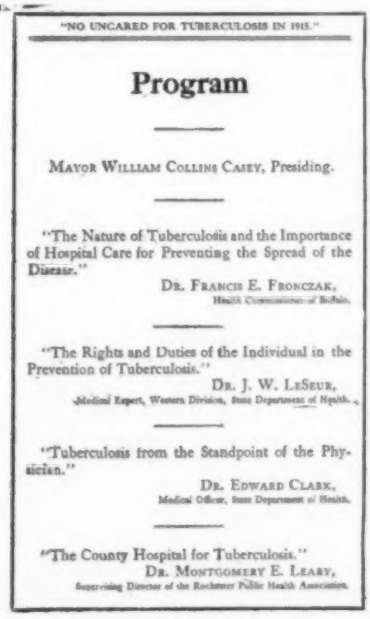
Don't Give Consumption to Others
The spit and small particles coughed up and sneezed out by consumptives, and by many others who don't know they have consumption, are full of tiny living germs.
THESE GERMS ARE THE CAUSE OF CONSUMPTION
Don't spit on the sidewalks--it spreads disease
Don't spit on the floors of your rooms
Don't spit on the floor of your workshop
DON'T LET OTHERS GIVE CONSUMPTION TO YOU
Committee on the Prevention of Tuberculosis
State Charities Aid Association.
TUBERCULOSIS EXHIBITION
Middletown State Armory
April 5th to 10th, inclusive
ADMISSION FREE
Illustrated Lectures
DAILY AT 3 AND 8 O'CLOCK P. M.

Front and back of an admission card that carries propaganda material used in pay envelopes and distributed in churches.

would hold approximately six thousand persons. He particularly wanted to reach the people in the congested districts of the city. He recognized the importance of having the program interesting as well as instructive and adopted the rather novel scheme of introducing vaudeville acts between the addresses. The professional services were contributed. This in itself would have attracted a large crowd, but it would not necessarily reach the people the meeting was intended especially to benefit.

To accomplish the latter purpose he prepared tickets of admission and saw to it that the policemen of the city whose beats were in the districts he especially wanted to reach, were supplied with large quantities of these tickets. Through the police, the firemen, labor organizations, social workers and others, he distributed these tickets broadcast in the congested districts of the city. In this way he filled his auditorium to overflowing with exactly the class of people that his meeting was intended to benefit. They saw a good show, and carried away with them not only the pleasant impression of an amusing evening, but also the information that was contained in the addresses which were plentifully mixed with the vaudeville entertainment.

The following plan was followed with success by a tuberculosis committee in organizing a meeting in a city of twenty thousand. This plan resulted in a crowd of fifteen hundred persons in a state armory. The meeting was one feature of a week's campaign which centered about an exhibit shown in the armory.



"NO UNCARED FOR TUBERCULOSIS IN 1915."

Program

MAYOR WILLIAM COLLINS CASEY, Presiding.

"The Nature of Tuberculosis and the Importance of Hospital Care for Preventing the Spread of the Disease."

DR. FRANCIS E. FRONCZAK,
Health Commissioner of Buffalo.

"The Rights and Duties of the Individual in the Prevention of Tuberculosis."

DR. J. W. LESEUR,
Medical Expert, Western Division, State Department of Health.

"Tuberculosis from the Standpoint of the Physician."

DR. EDWARD CLARK,
Medical Officer, State Department of Health.

"The County Hospital for Tuberculosis."

DR. MONTGOMERY E. LEARY,
Supervising Director of the Rochester Public Health Association.

"NO UNCARED-FOR TUBERCULOSIS IN 1915.

Will Batavia Act?

In Order to Prevent the Spread of Tuberculosis The Following Measures Should be Instituted:

1. The physicians of this city and county should comply with the provisions of Sections 210-11 of Article XVI of Public Health Law, constituting Chap. 45 of Consolidated Laws, requiring a complete registration of all living cases of Tuberculosis with the local health officer.

2. The Board of Supervisors should provide a County Hospital for Tuberculosis, and not in connection with the Alms House, where no one will go.

3. A Tuberculosis Dispensary, where free examination may be had by any one who suspects that he has Tuberculosis, but is unable to employ a physician; where reliable information and literature may be had free of charge, and where suitable relief will be administered.

4. A visiting nurse to be attached to such dispensary.

5. A relief committee to provide for the needy families of cases where the wage earner is incapacitated and is undergoing treatment at a sanitarium, hospital or at home.

6. A suitable building code to prevent the construction of buildings and tenements that are to become centers of congestion and infection.

7. Supervision of food supplies by the Board of Health, especially the meat and milk.

8. Inspection of public lodging houses by the Board of Health.

9. An educational center from which a continual campaign can be conducted with a view of enforcing such measures as

a. The cleaning of streets by flushing with water except in freezing weather, instead of dry sweeping.

b. The adequate ventilation of school houses, churches, theatres and all other public buildings, and the cleaning of the same by damp sweeping and dusting instead of dry sweeping and dusting.

c. Frequent illustrated lectures and a distribution of suitable leaflets to school children, teachers, fraternal orders, labor unions, etc.

Two pages of program showing the use of propaganda material.

1. The list of speakers, of course, was attractive. In addition to this two interesting motion pictures were advertised and their stories were told in the papers previous to the meeting. A military band paraded the principal streets and gave a concert in front of the hall previous to the meeting and in the hall at the opening of the program.

2. Paid advertising was run in all the newspapers of the city.

3. A carefully prepared "form" letter was multigraphed on the personal paper of one of the most influential friends of the movement. These were signed personally and addressed individually to two or three hundred of the leading people of the community. The letter told the purpose and importance of the meeting and urged each recipient to be present.

4. The program of the meeting was printed in an attractive folder upon which was also displayed information on the movement and other propaganda material. These were sent out in advance of the meeting to two or three hundred of the most prominent people of the city.

6. Prominent people wrote to the newspapers, calling attention to the importance of the movement and to the desirability of having a large crowd at the meeting.

7. Important literature was sent to the leading people of the city.

8. The clergymen announced the meeting from their pulpits and printed something about it in their church bulletins the Sunday previous.

9. Four or five illustrated articles were published in the local papers, showing what other cities had done, particularly cities of the same size.

10. A full discussion of the speaker

"The Public Have Recognized Their True Foe in Tuberculosis and They Are Stirring to The Combat Throughout The Civilized World."—Welch.

MASS MEETING

TUESDAY 8 P.M.

State Armory

The Struggle of the Public To Suppress Tuberculosis

EXTRACT FROM AN ADDRESS BY GOVERNOR CHARLES E. HUGHES

"If we had through the misfortunes of war, or the sudden rise of pestilence, or through some awful calamity, the destruction of life that annually takes place on account of the spread of this disease (Tuberculosis) we should be appalled and mass meetings would be held in every community and demand would be made that the most urgent measures should be adopted. It is only because we are accustomed to this waste of life and are prone to think that it is one of the dispensations of Providence that we go on about our business, little thinking of the preventive measures that are possible."

ADMISSION FREE!

Attend the Anti-Tuberculosis

Mass Meeting

TO-NIGHT

Odd Fellows' Temple

ELLICOTT STREET

Prominent Speakers

ADMISSION FREE!

Press of The Times, Rosetta, N. Y.

"Throwaways" with and without propaganda.

was given to the newspapers, bringing out what he had done, his writings and why he was considered an authority on tuberculosis.

11. Several thousand admission tickets were distributed throughout the city through the schools, the churches, lodges, labor unions and women's clubs. These tickets advertised the fact that the meeting was free and the fact that tickets were distributed kept very few, if any, persons who might not have secured tickets from trying to get into the meeting. They were an additional means of publicity, and the possession of a ticket in many cases gave the possessor a feeling that in a measure it was neccessary for him to attend.

In addition to the schemes employed for the above described meeting many others are possible.

Unless the dignity of the occasion would be sacrificed it would be possible to send wagons about the streets on the day of the meeting, covered with canvas signs.

Street car advertising is always valuable, although it is rather difficult to obtain. The street car companies sell the advertising privilege usually to distant corporations, so that except in rare instances nothing will be possible beyond hanging a small bundle of dodgers in the cars or placing a sign on the fenders.

In the larger cities billboard space can be obtained and used with profit.

Merchants frequently permit dodgers to be placed in their bundles and it is also possible to put small enclosures with the bills going out from gas, telephone and water companies. Similar enclosures in pay envelopes give valuable publicity.

A committee of from twenty to one hundred women will render good service by taking a list of important names and calling up from five to twenty-five persons each on the day of the meeting.

The one big fact to remember, however, in organizing any kind of a meeting is this: that once you are committed to it you can afford to spare no effort and no reasonable expense in making it a success.

Usually the many other possible means of securing publicity will get you more of it and will not be so fraught with danger to your cause. Occasionally, however, a meeting seems to be absolutely necessary. If this is the case, decide first on how large a meeting is necessary or how large a one you can get, and then leave no stone unturned to reach your goal. Whether it be a group meeting of a few interested citizens, a meeting for the organization of a committee, a meeting that is intended to get together only a hundred or so of the most important citizens, or whether it is to be a so-called mass meeting,—its effectiveness and its value to your cause depends upon how nearly you approach your goal as to size and how impressive are the speakers.

Considering meetings in general, and realizing the large proportion of unsuccessful ones, about the best advice that can be given to a committee considering the question is—Don't do it! But if you must, do it hard.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

THE annual meeting of the Massachusetts Association of Boards of Health was held at the Brunswick Hotel, Boylston Street, Boston, Thursday, January 27, 1916, Dr. M. J. Rosenau, president, in the chair.

The treasurer, Dr. Francis G. Curtis, of Newton, presented the following report which was accepted and placed on file:

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

In account with FRANCIS GEO. CURTIS, *Treasurer.*

INCOME.

Balance for 1914		$1,299.50
Sale of tickets for lunch, April meeting	$193.50	
Tickets for other lunches	3.00	
Extra Journals	14.50	
Dues and Subscriptions	474.50	
Interest	44.72	730.22
Total receipts		$2,029.72

EXPENDITURES.

Reporting meetings	$208.90	
American Public Health Ass'n (Journals)	534.63	
Expenses of the Secretary	73.23	
Expenses of the Treasurer	35.00	
Committee expenses	12.30	
Legal expenses (2 years)	300.00	
Expenses, January meeting	14.50	
Cigars	5.10	
Lunch, April meeting	200.00	
Rent of Halls, April meeting	84.00	
Total expenses		$1,467.66
Balance to 1916		562.06
		$2,029.72

Of the balance, $420.86 is in Savings Bank
97.70 is in National Bank
43.50 is in hands of Treasurer

Respectfully submitted,

(Signed) FRANCIS GEO. CURTIS, *Treasurer.*

The following were elected to membership in the Association:

Miss Mary Beard, 561 Massachusetts Ave., Boston, Mass.; Mr. Julius Chandler, Duxbury, Mass.; Mr. George M. Gifford, Brockton, Mass.; Dr. Loring Grimes, Swampscott, Mass.; Dr. P. E. Hurley, Holyoke, Mass.; Mr. John C. Lee, Greenfield, Mass.; Dr. George Mossman, Westminster, Mass.; Mr. Franklin B. Stacey, Andover, Mass.; Mr. John W. Tapper, Lynn, Mass.; Miss Mary C. Wiggin, 4 Joy St., Boston, Mass.

Dr. G. L. Tobey of Clinton, chairman of the Legislative Committee presented the following report which was accepted and placed on file:

REPORT OF THE LEGISLATIVE COMMITTEE TO THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

Your Legislative Committee submit the following report:

During the session of the Legislature of 1915, your committee examined and kept track of all the bills introduced in the Legislature, affecting the public health. In doing this, your committee gave a detailed examination to over fifty bills which were introduced in the Legislature.

The bills which appeared to be most important were given particular attention, and your committee attended or was represented at the hearings upon them. The legislation which perhaps attracted the most attention along the lines of public health during the last year's session was the act in reference to excluding certain ingredients from the manufacture of bread. It will be remembered that the hearing upon this bill lasted for several days and received a great deal of attention in the public press. Your committee was in attendance at these hearings with counsel and appeared in favor of the enactment of some legislation along the lines of the

bill proposed. These hearings resulted in the enactment of Chapter 258 of the Acts of 1915, which provides that bread, manufactured to be sold by the loaf shall be made from one or more of the following substances:

Wheat flour, rye flour, corn flour, lard, vegetable oils, butter, sugar, malt extract, corn syrup, salt, yeast, water, milk, corn sugar, serial flakes; and any other substance commonly sold at retail as food. The bill also provides, that bread in the manufacture of which any other materials are added, shall be labeled with a statement indicating the presence of such other materials, and that no materials shall be used which are poisonous or which are injurious to health. The bill also provides penalties and means for its enforcement. While there was much other legislation affecting public health there were no other bills which began to attract the attention of the public as the above. No legislation was enacted which seriously changed the operation of the laws affecting the production and sale of milk.

During the session, your committee was represented by Amos T. Saunders as legislative counsel, the same as for the year, 1914.

Respectfully submitted,

GEORGE L. TOBEY,
Chairman.

It was voted to appropriate $150 for the current year for legal counsel for the Committee on Legislation and to continue the committee.

It was voted that before any Association moneys are appropriated requests for the same be referred to the Executive Committee for its consideration and recommendation.

It was voted that it is the sense of the Association that at least two of the meetings each year ought to be held outside of Boston.

It was voted that applications for membership be accompanied by dues of one dollar.

REPORT OF THE NOMINATING COMMITTEE.

MR. COFFEY: Mr. President, the Nominating Committee report in favor of Dr. Frank A. Woods of Holyoke for president, Dr. F. X. Mahoney of Boston for first vice-president, Dr. W. W. Walcott of Natick for second vice-president, Dr. F. H. Slack for Secretary, Dr. F. G. Curtis of Newton for treasurer, and for Executive Committee Dr. A. MacKnight of Fall River, Dr. C. E. Simpson of Lowell, Dr. F. H. Thompson of Fitchburg, Mr. R. L. Newcomb of Salem and Dr. F. G. Wheatley of North Abington.

The report of the Nominating Committee was accepted and the above named persons unanimously elected as officers of the Association for the ensuing year.

Doctor Palmer, of South Framingham presented the following resolution:

Resolved, That in view of the urgent need of immediate provision for tuberculosis hospitals for the care of the advanced and hopeless cases, the Massachusetts Association of Boards of Health at its annual meeting respectfully and earnestly urge upon the members of the Legislature to hasten, so far as possible, the building of the so-called district hospitals for the care of such cases.

Discussion.

DOCTOR PALMER: I have only just a word in explanation to give why I present the resolution. I was called this morning, as I presume all of you are, to some critical, hopeless cases, that cannot be cared for in their own homes. Already steps have been taken towards the establishment of these hospitals, and the object

of this resolution is to use what influence we have to urge upon our legislators immediate action to hasten the day when we can have proper homes for these hopeless cases of tuberculosis, thereby avoiding danger to their families and the communities where they exist.

Mr. Borden: Mr. Chairman, I am not fully informed on the proposition, but I understand a bill is being prepared concerning the establishment of district hospitals. What that bill will contain I don't suppose anybody present knows. It seems to me that to endorse a plan of district hospitals without knowing the plan is to put ourselves on record unintelligently.

The President: This endorses the plan, irrespective of the wording of any bill. A plan is probably in the minds of many of this Association as a good plan, and perhaps we all believe in it. It is a good plan.

Mr. Borden: Of course I am not so sure in my own mind that it is a good plan; perhaps all other gentlemen are agreed that it is. The question has been threshed out for several years as to the establishment of state hospitals and now district hospitals. Coming from the larger cities, we have no particular interest in it, except as the interest exists throughout the Commonwealth in the establishment of district hospitals. Just what is meant by district hospitals I am sure I don't know, because in trying to learn something about them I could not find out what was planned for those district hospitals and how they were going to be established.

The President: Perhaps Dr. G. R. Kelley of the State Health Department, will tell us something about the plan for district hospitals in the state.

Doctor Kelley: Mr. Chairman, I don't feel that I can state with any assurance what legislation will be recommended, as you all probably remember, the last General Court passed a resolve authorizing and directing the State Department of Health to make investigations as regards the advisibility of establishing county or district hospitals for the care of consumptives, and also directing the department to make a report to this General Court, accompanied with proposals for legislation. Following the line of the resolve, the eight district health officers have made rather careful investigations, trying to determine how many beds are needed for each section of the Commonwealth, both in cities of 50,000 and over, which are exempted by this resolution, and for communities under 50,000. As a result, we have drafted in a rough form and have submitted to the public health council of the State Health Department, four distinct bills. They provide for different schemes. The public health council is just beginning to take up the consideration of them. Whether they will adopt the features of one bill exclusively or take features from several, or finally redraft a new bill, of course I cannot say. They will do what they think is best under the circumstances. Our object was to get before them all schemes that seemed to be at all feasible.

When we first began this work we were advised to take groups of smaller cities and towns, disregarding any of the county lines. That is theoretically a very fine scheme, but I am convinced that it is practically unworkable.

I drafted a bill of some twenty odd pages trying to get something on paper that would fit this plan, and it is obviously unworkable. I don't believe we could ever get district hospitals along that line. Any bill that is practical utilizes the county unit.

I think there are really just two practical schemes. One is to utilize the county lines, providing of course, for as many institutions as may seem necessary within the county, or in some cases combining counties. In Franklin the local sentiment seems to be a unit that they do not want to build a separate tuberculosis hospital. There seem to be the very best of reasons why they should not build a county tuberculosis hospital, the one best reason being, that the county would not have enough consumptives to run such a hospital on a business-like and economical basis. There is now located just outside the city of Northampton, in the neighboring county of Hampshire, a very complete and well-equipped sanitarium. That sanitarium has not enough call for it from Hampshire County alone to run it on the most economical basis per capita. That sanitarium is as accessible from the portions of Franklin County where probably 80 per cent. of the population is as it is from many portions of Hampshire County, so there would seem to be no good and valid reason why those two counties should not combine. On the other hand, for a county such as Middlesex it would be foolish to combine with another county.

Our minimum estimate is that there are not less than 500 beds needed in Middlesex County, and it is obviously improbable that that county could be served advantageously by any one hospital.

That is about the way the matter rests. I have given more of an explanation than you probably have had before, for the simple reason that we are trying to avoid giving any expression of opinion, because it is so incomplete. Perhaps I have been premature now, because it is really up to the public health council to recommend legislation to the General Court, and they simply have our rough ideas before them for consideration.

MR. BORDEN: I don't want to do anything to prevent small towns from making proper provision. I am wondering if it would take the meat out of the bill if we endorsed a provision for tuberculosis hospitals for towns of less than 50,000.

DOCTOR KELLEY: We cannot do anything else under the language of the resolve. That is precisely what the resolve is.

MR. BORDEN: District hospitals. It is a question who is going to supervise those hospitals. When the bill comes in shape some of you gentlemen representing those towns may be opposed to them, although you will already be on record as being in favor of practically any plan which the public health council endorses. If you put up in general language that you endorse any scheme for the building of hospitals throughout the state, you put yourselves on record as knowing the need of such institutions; but district hospitals mean picking out certain districts and carrying on a hospital in some particular way which is now being evolved, which may or may not be agreeable when you gentlemen know what it is. I hate to oppose any resolution that comes before this Association for the benefit of the public, but I have always felt with a board of this sort that the public relies upon its intelligent action, and that we ought to know what we are voting upon in more or less detail before we put ourselves on record in favor of it.

DOCTOR PALMER: May I ask if it would remove the objection of the last speaker if as an amendment the word "district" were to be changed to "more hospitals?"

MR. BORDEN: Yes, certainly, some language of that sort, because the word "district" fixes it to some particular plan.

The resolution as amended was adopted.

Mr. Robert N. Hoyt presented the following progress report of the committee on standardization of local health regulations:

SECTION ON COMMUNICABLE DISEASES.

I. REPORTING DISEASES.

(1) *Diseases which must be Reported.*

The following diseases have been declared by the State Department of Health to be dangerous to the public health and therefore must be reported to the Board of Health.

Actinomycosis
Anthrax
Anterior Poliomyelitis (Infantile paralysis)
Asiatic Cholera
Chicken Pox
Diphtheria
Dog-Bite (Requiring anti-rabic treatment)
Dysentery:—
(a) Amebic
(b) Bacillary
Epidemic Cerebro-Spinal Meningitis
German Measles
Glanders
Hookworm Disease
Infectious Diseases of the Eye:—
(a) Ophthalmia Neonatorum (inflammation of the eyes of the newborn)
(b) Suppurative Conjunctivitis
(c) Trachoma
Leprosy
Malaria
Measles
Mumps
Pellagra
Plague
Rabies (Hydrophobia)
Scarlet Fever
Septic Sore Throat
Smallpox
Tetanus (Lock jaw)
Trichinosis
Tuberculosis (all forms)
Typhoid Fever
Typhus Fever
Whooping Cough
Yellow Fever

(2) *Physicians must Report Diseases.*

When a physician knows that a person whom he is called to visit is infected with a disease dangerous to the public health, he shall immediately

give notice thereof in writing over his own signature to the Board of Health.

NOTE.—It is recommended that in all cases of scarlet fever, diphtheria and smallpox and in cases of typhoid fever or septic sore throat when occurring in the household of any person engaged in the production, transportation or handling of milk, or when presumably caused by the consumption of infected milk, the written report shall, when practical, be preceded by an immediate telephone report to the Board of Health.

(3) *Householders must Report Diseases.*

A householder who knows that a person in his family or house is sick with a disease dangerous to the public health shall forthwith give notice thereof to the Board of Health.

II. ISOLATION AND SICK ROOM REGULATIONS.

(4) *Isolation of Infected Persons.*

Whoever is infected with diphtheria, scarlet fever or smallpox shall be isolated to the satisfaction of the Board of Health and no person so infected shall leave the hospital or room designated by the Board of Health until given permission by them.

No person other than the attending physician, clergyman, necessary attendants and agents of the Board of Health shall enter nor shall any dog or cat be allowed to enter any room or apartment set apart for the isolation of a case of diphtheria, scarlet fever or smallpox.

All persons entering the room or apartment where a case of diphtheria, scarlet fever or smallpox is isolated shall take such precautions and practise such measures of cleansing or disinfection of their persons or garments as shall be prescribed by the Board of Health.

No person shall permit any child, minor or other person under his charge, infected with measles, whooping cough or anterior poliomyelitis to come in contact with others than adult or immune members of the household.

(5) *Disinfection of Articles and Excretions.*

No article shall be removed from the room in which a case of scarlet fever, diphtheria or smallpox is isolated until disinfected as required by the Board of Health.

(6) *Duration of Isolation.*

Isolation and quarantine shall continue until release by the Board of Health.

The minimum period of isolation or quarantine of a person having any of the following diseases (reckoned from the date when the notice of such disease is mailed) shall be as follows:

Diphtheria: until two successive, negative cultures, taken from the site of the disease at least 24 hours apart have been obtained.

Scarlet Fever: 28 days and thereafter until all abnormal discharges have ceased.

Smallpox: until desquamation ceases.

Anterior Poliomyelitis: 28 days.

III. EXPOSED PERSONS.

(7) *Maximum Incubation Periods.*

Persons who have been exposed to diseases dangerous to the public

health shall be deemed to be in danger of contracting such diseases unless immunized by an attack or by vaccines or unless free from symptoms of the disease during the following longest common incubation periods after the latest exposure.

Diphtheria: 8 days.
Scarlet Fever: 8 days.
Smallpox: 21 days.
Anterior Poliomyelitis: 14 days.
Chicken Pox: 21 days.
Measles: 14 days.
Mumps: 21 days.
Whooping Cough: 14 days.

NOTE.—It is recommended that persons who have been exposed to diphtheria, scarlet fever or smallpox be under observation during the above incubation periods.

IV. EXCLUSION FROM SCHOOL.

(8) *Exclusion of Infected Children from School.*

Persons who are or lately have been infected with any disease dangerous to the public health shall be excluded from all schools and gatherings of children during the following periods and until given a permit by the Board of Health:

Anterior Poliomyelitis: 28 days.
Diphtheria: until released from isolation.
Chicken Pox: until skin and mucous membrane lesions heal.
German Measles: 7 days after appearance of the eruption.
Measles: 10 days after appearance of the eruption.
Mumps: 21 days.
Scarlet Fever: 35 days and until all abnormal discharges have ceased.
Smallpox: until desquamation ceases.
Typhoid Fever: until recovery.
Whooping Cough: 21 days and during the paroxysmal stage.

(9) *Exclusion of Exposed Children from School.*

Children who are members of a household where a case of disease dangerous to the public health exists or who have been exposed to such a disease shall be excluded from all schools and gatherings of children during the following incubation periods or until a permit is granted by the Board of Health.

Diphtheria: 8 days.
Measles: 14 days unless immunized by a previous attack.
Scarlet Fever: 8 days.
Smallpox: 21 days unless recently successfully vaccinated.
Whooping Cough: 14 days unless immunized by a previous attack.

V. QUARANTINE OF PREMISES AND HOUSEHOLD.

(10) *Placarding of Dwellings.*

The Board of Health shall give warning of the existence of each of the following diseases by posting a placard bearing the name of the disease near one or more of the entrances to the dwelling, apartment or room in which such case is located.

Anterior Poliomyelitis (Infantile paralysis).
Diphtheria.
Measles.
Scarlet Fever.
Smallpox.
Whooping Cough.

The Board of Health shall give such warning of other diseases dangerous to the public health as shall be necessary for the protection of the public or as shall be required by law.

No person shall, without permission of the Board of Health, remove, obliterate or deface such placard and the responsible head of the household shall immediately notify the Board of Health in the event of the removal, obliteration or defacement of such placard.

(11) *Restrictions for Scarlet Fever, Diphtheria and Smallpox.*

The posting of a placard on a dwelling, apartment or room where a case of scarlet fever, diphtheria or smallpox exists shall impose the following quarantine regulations which shall apply to all portions of the dwelling within the placarded entrances and to persons living therein.

No person in whose dwelling there shall occur a case of scarlet fever, diphtheria or smallpox shall, without the permission of the Board of Health, remove or permit to be removed from the dwelling any clothing or other article which may have been exposed to infection.

No occupant of such a dwelling shall take up residence elsewhere nor enter any public gathering or conveyance without the permission of the Board of Health.

(12) *Restrictions for Measles, Whooping-Cough and Anterior Poliomyelitis.*

The responsible head of the household where a case of measles, whooping-cough or anterior poliomyelitis occurs shall see that children who are not members of the household are excluded unless known to be immunized by a previous attack of the disease.

(13) *Milk Bottles.*

No milk bottles shall be removed from a house in which there is or has been a case of diphtheria, scarlet fever or typhoid fever without permission of the Board of Health.

(14) *Public Libraries.*

There shall be no interchange of books between libraries and quarantined households.

(15) *Public Funerals Forbidden in Certain Cases.*

No public funerals shall be held of any person who has died of diphtheria, scarlet fever or smallpox.

NOTE.—The purpose of this regulation is to prevent the spread of disease by the living members of the deceased's household who may be convalescent from the disease or who may have the disease in a mild or unrecognized form.

(16) *Exclusion from Business.*

No person shall engage in the handling of milk or food nor in an occupation bringing him into close contact with children after exposure to or while residing in a household in which there is a case of scarlet fever, diphtheria, typhoid fever or smallpox without permission from the Board of Health.

Other persons may be required to remove from the dwelling or to abandon their occupations if the nature of the isolation of the patient or the amount of contact occurring in the occupation are held by the Board of Health to require such action.

VI. Tuberculosis.

(17) *Disposal of Sputum.*

Every person suffering from tuberculosis shall dispose of his sputum in a manner which shall not endanger the public health.

(18) *Notice of Removal.*

Whenever a person with tuberculosis changes his residence, the attending physician, if there be one, or the active head of the household in which the patient resides forthwith shall notify the Board of Health of the change and both of the above mentioned persons shall be held legally responsible for the violation of this order.

Committee on Standard Local Health Regulations.

Clarence J. Allen, M. D., Winchester.
John A. Cook, Provincetown.
Edgar Guild, M. D., Springfield.
Frederic W. Howe, Framingham.
L. A. Jones, M. D., State Health Officer.
Frank W. Jackson, Brockton.
George T. Lennon, Haverhill.
David J. O'Connell, Esq., North Easton.
Robert N. Hoyt, Wellesley, Chairman.

It was voted that the report be laid on the table until the next meeting for discussion. Dr. F. P. Denny presented the following report for the Committee on Incorrigible Consumptives:

Doctor Denny: In compliance with the vote of the Association last October the committee prepared a draft of two bills which have been submitted to the Legislature, and I think a copy of these bills has been sent to all members of this Association. One bill, 322, provides that authority be given for the commitment of any tuberculosis patient to a hospital, and also the transference from a tuberculosis hospital to a special institution of the state if he does not follow the rules and regulations of the hospital. Unfortunately, the two bills got separated in the Legislature, and a hearing was given this morning on bill 323, which provides for the erection of a hospital for the incorrigible consumptive by the trustees of hospitals for consumptives. The legislative committee agreed to continue the hearing on this bill until bill 322 was to be taken up, because they obviously should be considered together. Our committee hopes that when House Bill 322 comes up for consideration as many members of this society as possible will be present, and especially that they will bring to the committee instances of difficulties that the different boards of health have had in controlling the incorrigible consumptive. Mr. Stone is also very anxious to know of instances where city solicitors have expressed the opinion that there was not at present sufficient power given boards of health to commit consumptives to hospitals, and he would be very glad if anyone would tell him or tell any member of the committee of instances where any expression of opinion had been given that the boards of health have not sufficient power at present.

It was voted that the report be accepted as progressive.

A symposium on Influenza and Pneumonia was then presented. (This symposium is printed elsewhere in this issue of the Journal.)

Book Reviews.

Educational Hygiene. *Edited by Louis W. Rapeer, Ph. D. New York: Charles Scribner's Sons, 1915. Cloth, 8 vo. Pp. XIX + 650, 104 ills., bibliography. Price, $2.50.*

This work is designed to bring together, in one organized and comprehensive volume, the latest information and advice of specialists in all the large phases of its subject. In scope and dimensions it illustrates strikingly the expansion and specialization in this distinct field of the great subject of hygiene. In thirty-three chapters it runs the gamut through the five divisions of medical supervision, physical education, school sanitation, the teaching of hygiene, and the hygiene of instruction. This scope carries the work beyond the limits of "school hygiene" as commonly understood and makes it practically a hygiene of childhood from the point where infant hygiene leaves off,—as the subtitle indicates, "from the pre-school period to the university." Just as a broader conception of Health Department administration has reached out to include matters formerly neglected or relegated to personal hygiene, so the larger educational hygiene has ramified beyond the arbitrary limits of the school.

In its almost encyclopedic dimensions the work contains chapters variously of interest to school administrators, teachers, medical inspectors, school nurses, health officers, and parents. The book is not, however, merely a reference book in form or style; rather is it a collection of correlated monographs on separate phases, averaging a score of pages each. The readability of the whole is much enhanced by the typographical scheme and the many examples, diagrams, and photographic illustrations.

The broad conception which governed the synthesis of the work is indicated by the title of Part One,—"Health Sociology." It is worth while dwelling somewhat on this part in order to indicate the basis and viewpoint of the whole. The opening chapter, by the editor, on "Public Health and the Public Schools" covers a wider ground than the title would suggest and is, in fact, a condensed but interesting treatment of the general public health problem, with an admirable statistical survey and some emphasis on recent tendencies, such as "socialization," and education through publicity. In this chapter, which concludes with the school health problem, the following significant summary occurs: "The problem of health is one of the most serious that the country faces. The conservation of our natural resources, such as soils, minerals, forests, and water-power, is a mere bagatelle compared with the problem of the conservation of our human resources. Of these we are criminally wasteful. While we are making some headway in the control of typhoid, smallpox, tuberculosis, the diseases of infancy, and others, there has arisen in recent years an increasing number of degenerative diseases in middle life due largely to ignorance of personal hygiene. Such increases tend to keep the death-rate as high as it has been in the past."

Chapter II continues the theme of the first, going more specifically into the phases of the public health movement. The author quotes the remark of Professor Sedgwick that the public health movement is going almost too fast for wisdom, and calls for the consolidation of sanitary science and the direction of money and efforts into the really most effective channels. Concentrated sections are devoted to typhoid fever, infant mortality, school medical supervision, communicable diseases of childhood, vital statistics, and other leading topics. It is curious that emphasis is laid on whooping cough as an important cause of death while no mention is made of measles, of the same category of importance. The author believes that the chief problems, in general, are education, concentration, and coöperation, and points out the smallness of health appropriations, but omits to stress organization and the necessity for better training for public health service—equally important and certainly more concrete objects.

Heredity and the home hygiene of children take an important place in this part of the book, which closes with chapters on "Public Coöperation for School-Health Agencies" and the functions of the social center. The former of these last deals largely with various kinds of unofficial but quasi-public organizations and with publicity. The inexperienced would avoid

confusion by leaving the possibilities covered in this chapter until they have mastered the substance of other parts of the book. On page 89 occurs an instance of inaccuracy in publicity for a good purpose, where is cited an argument for dustless cleaning based on the supposed importance of dust as a germ-carrier;—an unintended illustration of the necessity for tuning enthusiasm to scientific fact.

Part Two deals with "The Administration of Educational Hygiene," while Part Three, which constitutes two thirds of the volume, goes into the divisions and practice of the general subject under the heads of "Medical Supervision of Schools," "School Sanitation," "Physical Education," "The Teaching of Hygiene," and "The Hygiene of Instruction." It is quite impossible in a short space to attempt to do justice to the various chapters under these heads,—such excellent ones, for instance, as those on standardization of school medical service, the school nurse and her work, public school clinics, and open-air and open-window schools. In view of the dangers and deficiencies to be avoided in rural schools, the chapter on their sanitation is most appropriate. The teaching of hygiene in elementary schools is treated with practical effectiveness, all traces of old ideas of the subject as one of mere text-book knowledge being swept away to make room for the modern method of direct application. The foundations of industrial hygiene are concerned in a chapter dealing with vocational education. Part Four is brief, dealing in two chapters with the hygiene of the college.

The relation between health and school progress is outlined in an appendix. A valuable chart summarizing the communicable diseases of children and giving rules for isolation and school exclusion is also appended. The index is short, but the need for it is much diminished by the convenient internal arrangement of the book.

The effort of the editor to restrict the volume to "minimum essentials" has been accompanied by special attention to references and an excellent guide bibliography of books, reports, and periodical sources. Altogether this work should do much to solidify and organize the movement of educational hygiene and should take a conspicuous place as an invaluable comprehensive survey of the subject.

J. Scott MacNutt.

Sanitation in Panama. *Author William Crawford Gorgas, Surgeon-General, U. S. A. Cloth 7½ x 5 inches; 298 pages, 15 illustrations. D. Appleton & Co., New York. $2.00.*

The story of the Sanitation in Panama, as told by General Gorgas himself in his new book, is one of the most unusual and fascinating in all the annals of scientific achievement. The many interesting accounts of the early history of Havana and Panama reads like a romance. While it is written as a narrative, it is, nevertheless, thoroughly scientific and orderly in arrangement.

The manner in which General Gorgas tells of the early studies of yellow fever at Havana, and the most interesting relationship which existed between Doctor Finlay, the Army Board and himself, brings out many beautiful characteristics of these men.

While reading the book one is very much impressed with the great modesty of General Gorgas concerning his own work, and the care which he takes to give credit to those who preceded him, especially those who established the theory of the transmission of yellow fever by the mosquito. We who have had the great pleasure, as well as the honor to serve with General Gorgas, know how kind and unselfish he always is in regard to giving credit where credit is due.

The author touches very lightly upon the opposition that he encountered with some of the officials during the early days of the work. But it is not necessary to think of those things now, as he has so wonderfully won out in his great work, which more than repays him for his many trials and much labor.

The last chapter brings the book to a close by describing some of the work done in Panama, and summarizing the results of the Sanitation of the Tropics,—what these results mean to civilization as a whole, and especially to the white race,—the possible changes that will come about, as to the centers of civilization. This makes one believe that the sanitary phase of the Canal work will be considered far more important than the actual construction of the Canal itself, as the years go by.

James Ten-Broeck Boules.

Ten Sex Talks to Boys (*10 and older*); **Ten Sex Talks to Girls** (*14 and older*). *By Irving Davids Steinhardt, M. D. Philadelphia: Lippincott, 1914. $1.00 each.*

Doctor Steinhardt has given in these two books what he himself calls "talks" as they were originally planned for audiences of girls and boys. Both books are written in plain, simple language, frequently, however, not adapted to the needs or understanding of boys of ten and girls of fourteen. In fact, the greatest fault in these books lies in the author's attempt to cover too wide a range. The author should have published at least six separate books instead of two. Few of us would feel it advisable to put in the hands of boys or girls from 10 to 14 books dealing so extensively with the sex problems.

Doctor Steinhardt begins by presenting the detailed anatomy and physiology of the sex organs, illustrated not by diagrams, but by detailed drawings from nature. There follows the hygiene of adolescence, with an extended discussion of constipation and masturbation, admonishing the young people of the bad effects of masturbation, by stating that it "will cause a breakdown of the nervous system, and cause you to end your days in a mad-house, or send you to an early grave." Such statements are calculated to terrorize unnecessarily, without offering the young people any real help in breaking the bad habit.

Venereal diseases are referred to as "the most loathsome of all human ills that leave disgrace and suffering in their wake; diseases that can blight a person's life from the very minute of coming into the world until the leaving of it; diseases that may cause life-long suffering, and insanity; diseases that in their ravages affect the innocent just as severely as the guilty." The chapter on these diseases gives the "loathsome" details of syphilis even to its advanced later manifestations. As though this were not terrifying enough for our children, the author "makes a pathetic address to an unhappy little syphilitic baby." Still this is not harrowing enough, and the young people are shown a picture of a syphilitic baby which I am altogether sure never will be forgotten, making the doctor's admonition "don't let these talks make merely a temporary impression upon you" quite unnecessary.

Following this, Doctor Steinhardt gives us a talk on sex ethics, emphasizing kissing, dressing, "bartering of sexual organs," dancing, flirting, etc. Much of this contains excellent advice for both boys and girls. Marriage is the next theme touched upon, both its dangers and its advantages. The author emphasizes the qualities which both boys and girls should look for in each other, even discussing at some length "the sexual relation in married life." He says:—

"Wives and husbands both have certain sexual rights which should be perfectly understood. Differences in sexual appetite must be adjusted to make a perfect union. A non-passionate wife, married to a very passionate husband, or the reverse, is liable to cause dissension, unless care and diplomacy are exercised by both. I advise moderation for the sake of their own health and happiness, and for the benefit of any offspring."

In a later talk the author deals with wifehood and motherhood, discussing the signs of pregnancy, the peculiar mental conditions of child-bearing women, and the necessity for medical attention. The doctor decides to "skip an interval—that of the birth of the child and what goes with it—and take up child-management." The closing talk deals with the signs of approaching menopause, with the various symptoms and necessary precautions.

When we think of the girl or boy of ten or fourteen reading all this, reading it alone, without the guiding wisdom of a parent or the sincere doctor himself, we are forced to the belief that Doctor Steinhardt has approached this subject with the attitude of the physician who is accustomed to consider the subject of sex enlightenment from the medical standpoint. What seems perfectly commonplace to him shocks inexperienced youth, and cannot fail to repel the experienced adult who, while accepting physical truths, still holds fast to the spiritual ideal.

These books contain much good material for parents, but they should not be placed in the hands of young people for whom the author states they are planned

Bertha Chapman Cady.

Health Department Reports and Notes.

REPORTS.

East Orange, New Jersey.

The group of contiguous municipalities embracing Orange, East, West, and South Orange, New Jersey, are of constant interest both for their individual progress and for the fact that, in spite of obstacles, they have managed to organize coöperation in dealing with certain of their common sanitary problems.

The present report is the first from East Orange since the reorganization of its health department in July, 1915, when the present health officer, Mr. John Hall, assumed charge. Mr. Hall exercises admirable selection in presenting data of interest to the intelligent citizen and to other departments, while omitting details of value only to the health department itself. The result is a clear, brief, well-balanced presentation of the salient points in the local situation and work of this city of 41,000. Beyond essential general figures, facts, statistical or verbal, are limited to those diseases and problems of greatest importance. This is a mode of procedure which might well be generally adopted in the reports of towns and small cities: to avoid statistical analyses which are proper only to large masses of data, to free the pages from insignificant routine detail, and to concentrate on bringing out in clear relief the salient local problems and results. Such a method simplifies, unifies, and renders impressive.

The health officer has followed the New Jersey Standard Plan for health reports, but has at the same time preserved his individual mode of treatment,—a demonstration of the fact that such a plan may be usefully applied without producing the perfunctory uniformity that some followers of peculiar local methods have argued against it. At the same time the report is an indication that any standard scheme should distinguish between the minimum substance essential to every local report and those details which cannot be uniformly prescribed.

A passage of more than local interest relates to two epidemics of scarlet fever in the Orange municipalities in successive years, involving respectively 33 and 56 cases, traced to milk supplies. "Both of these supplies," says Health Officer Hall, "were of good standing as far as sanitary dairies and bacteria counts were concerned, but it is impossible to avoid occurrences of this kind by any known system of dairy inspection of milk analysis. What was the ultimate remedy in these two epidemics could have been their prevention, *i. e.*, pasteurization."

Greater expedition in the handling of nuisances will appeal to health officers who desire to place stress on matters having less esthetic and more sanitary import. The idea of transferring certain duties in this line to the police is not new, but reports on its progress in application are none too many. Of the readjustment being worked out in East Orange, the health officer says:—"This will probably consist of giving one of the Health Department inspectors the authority of a special policeman and several police officers the title of Deputy Sanitary Inspectors, with the power to abate nuisances in the form of dirty yards, improperly cared-for refuse and the like. This plan will conserve for the Health Department a great deal of time spent on matters with a very remote relation to health, will give the individual policemen on their beats only a small amount of extra work and, in all, should add a great deal to the cleanliness and decency of the city."

The report closes with the following strikingly optimistic remarks on the development and extension of prevention:—"In cities of a high grade of municipal development the really vital health problems are changing, and the mortality statistics show the great amount of sickness and death is due to the diseases with which health authorities have heretofore had little to do. The actual public machinery of disease prevention is being developed nearly to its natural limit, and only with a great deal of private effort can improvement go on. Water supplies and sewerage systems are generally used, and in the up-to-date cities, give good service; milk will be pasteurized within a relatively short time; communicable diseases are on the decrease, and epidemics are quickly put under control. The six diseases causing 60 per cent. of the deaths are preventable, or at least postponable, but only by private effort. Cancer

can frequently be cured by timely operation; the organic heart diseases, apoplexy, Bright's disease and tuberculosis may be avoided by right methods of living; pneumonia need not have its great toll of deaths, if the rules of personal hygiene are closely followed, particularly during the winter months. The secret of health and life, especially in the ages above 40, is periodic medical examination to discover the beginning of these disorders, so that they may be remedied before it is too late. The great duty of the Health Departments is to impress these facts upon their people and, if this is done, results will be sure to follow."

Jackson, Michigan.

Another of the earliest reports for 1915 to appear is that of Jackson, Michigan, a city of 35,000, which has recently adopted commission government under the city manager system. That this change has worked for the improvement of the Health Department through reorganization appears from the report of Dr. C. G. Parnall, the health officer. From the executive down to the liberal number of four public health nurses the city evidently has the basic organization for the best of work. "Although the work of the department this year has been entirely reorganized and extended in scope, with the employment of full time officers and employees," writes the health officer, "these changes have been effected without increased cost to the taxpayers." One may well judge that the 24 cents per capita per year spent in Jackson on the public health is economically and effectively applied.

The health officer discusses briefly and interestingly subjects ranging widely from vital statistics to public comfort. Terminal fumigation has been largely discontinued and the emphasis placed on disinfection of discharges and proper sickroom sanitation under the supervision of the nursing service. Under the head of nuisances he proposes that efficiency would be promoted if all public patrolmen acted as sanitary inspectors. The report closes with a striking summary under three heads: "Results Accomplished," "Shortcomings," and "Needs";—a feature which adds distinctly to the readability and "snap" of the report.

Without detracting from the good impression produced by the report, it should be suggested that the presentation of vital statistics be somewhat revised. There is observable among health reports in general a strange reluctance to adopt the straight International Classification of causes of death; the present report for some not evident reason uses the international numbered titles, but arranges them alphabetically. Deaths and cases are analyzed to a plethora of columns by month, age, etc., while, on the other hand, one does not find death-*rates* for the chief causes. Scores for dairy farms are given individually, but one looks in vain for the bacteriological counts of the various supplies, an index of far greater value. Such long lists of ratings in any case emphasize the need for some system of grading or grouping. Some statement of the Health Department's prosecutions might well be given, unless the Jackson authorities occupy the Utopian position of needing to use only persuasion in the course of duty,—a situation which might readily be understood could all the citizens be brought to read this convincing report.

United Fruit Company Medical Department.

In some parts of the world—many of them tropical or otherwise presented special health problems—the health of the inhabitants depends to a large degree upon private concerns which assume many of the functions of public authority. Hence such a document as the present, which covers the medical and sanitary work of the United Fruit Company for the year ending September 30, 1915, well deserves a place among public health reports.

Some idea of the extent of this work is conveyed in the grand total of patients furnished treatment by the company's physicians in hospitals, dispensaries, and steamships, 116,461,—the average number of employees and others dependent on the company for medical service being 50,562. This furnishes the basis for a very considerable experience in tropical medicine and sanitation.

The report consists mainly of detailed sta-

tistical tables for seven separate districts and for employees and passengers carried on steamships. There is no general discussion, but from the brief letters of transmittal of the division superintendents may be gleaned some interesting items relating to sanitation, quarantine, anti-mosquito work, and the combating of hookworm and other tropical and semi-tropical diseases. Some of the work is experimental, as, *e. g.*, on treatment of intestinal parasites.

Of interest are the results of complete physical examinations of one hundred employees, picked indiscriminately from the better class, as follows: 32 per cent. had defective vision; 1 per cent. defective hearing; 3 per cent. heart lesions; 4 per cent. suffered from diseases of the respiratory system; 3 per cent. from nephritis; 33 per cent. showed glandular enlargement; 8 per cent. gave positive Wassermanns; 2 per cent. gonorrhœa; average age, 33.2 years.

Noteworthy work against rats and other vermin is mentioned, especially in connection with the steamships.

NOTES.

Typhoid Fever Reduction in New York City.—In the *Weekly Bulletin* of April 1 of the New York City Health Department, attention is called to the control of typhoid in that city as shown by the enormous reduction effected within the past ten years. During that time the typhoid fever death-rate per 100,000 population has been decreased from 14.78 (average 1905–09) to 6.0 for 1914. Thus among the cities in the United States of over 500,000, New York stands first in its control of typhoid fever with Boston and Chicago second and third. The larger European cities, for the most part, have lower death-rates, though the reduction of the rate in New York during the last few years has progressed at a rate equal to that of any other city in the world.

That the control of typhoid fever in this city is effective, is well evidenced. Every case of this disease reported to the Health Department is visited by an inspector who makes careful inquiries into the history of the case and records the facts elicited on a special history card. These cards are then analyzed by the Chief of the Division of Epidemiology. Below is an analysis which shows the result of such epidemiological investigations during 1915. For comparison the figures for 1905 are also given.

Source.	1915.	1905.
Out-of-town	372	535
Direct exposure	165	225
Milk	112*	525†
Food contaminated by flies carrying typhoid infection	95	
Carriers	118	
Watermelons floating in polluted harbor water	12	
Oysters		124
Water		864
	874	2,273
Unknown	1,582	1,312
	2,456	3,585

* Milk contaminated after pasteurization, by infected well water used at the creamery.

† Raw milk.

In respect to certain features of this analysis, the following explanation is taken from the bulletin:

"This analysis supports the contention repeatedly made by Bolduan that up to now the typhoid fever of most large cities in this country has been very largely rural, *i. e.*, extra-urban, in origin. In the above analysis, taking the 1915 figures, we should add the 372 out-of-town infections to the 112 infections due to milk infected at a creamery, a total of 486 cases of rural origin out of 874 cases whose origin was definitely traced, or at least 20 per cent. of the 2,456 cases reported. Taking the 1905 figures, we should add the 535 out-of-town infections, the 525 cases infected from milk, and the 864 cases infected from water, a total of 1,924 cases of rural origin out of 3,585 cases reported, *i. e.*, more than 50 per cent. In this city, therefore, an enormous reduction of typhoid fever of rural origin has occurred, and this is undoubtedly due to

(a) the effective chlorination of all the Croton water.

(b) the effective pasteurization of the milk supply.

The lesson taught by these figures is clear, and may well be studied by other American cities which desire to deal effectively with typhoid fever—the national disgrace."

✻

Half a Century of Health Work.—The *Survey* of March 18, 1916, draws attention to the fiftieth anniversary of the organization of the New York Health Department. It draws an inspiring picture of fifty years of remarkable progress.

"On March 5, 1866, the department was organized on a new basis. Eight years earlier, on the recommendation of a citizens' committee the state had provided for a special investigation of conditions in the city and necessary legislation for their improvement. The report of this special committee was a platform upon whose substantial planks the progress and success of the department has been for half a century a-building.

For the next ten or fifteen years the department was concerned chiefly with sanitary matters. But in 1866–1867 a few cases of cholera and yellow fever focused attention on disinfectants and established the value of carbolic acid and sulphur. In its second annual report the board drew attention to the prevalence of venereal disease and out of this recognition grew the present bureau to control venereal disease. In 1886 the "summer corps work" was started and developed into the excellent system now known as the Bureau of Child Hygiene. In 1897 the board turned its attention to milk, and periodical inspections were made of milk stores, creameries, and dairies.

"The department's progress through later years in publicity and public health education, the important researches of its Bureau of Industrial Hygiene, the significant beginnings of health center work, and its high degree of freedom from political complications, are too well known to need reiteration at this time. To the efficiency and public spirit of the leaders from Parker to Biggs and Goldwater and Emerson, as well as to the skill and coöperation of its staff, New York owes a large obligation which it may well recognize at this semi-centennial anniversary by plans for immediate extension of work so well begun."

Our Babies—How to Keep Them Well.—The Illinois *Health News* for March is given over entirely to the babies and tells in an extremely interesting way how to "keep the babies well and happy." The little pamphlet abounds in happy phrases scattered here and there, a few of which are given below:

"The beginning of life saving should be at the beginning of life. Prevention of disease for later life doesn't mean much to the baby that has been permitted to die in infancy.

"The baby is the only animal than can actually be benefited by an authentic pedigree. Pups and colts will never know whether they are registered or not.

"The dial of the scales is the Dun or Bradstreet of the baby's career.

"Among the few things unforgivable is the unwillingness of the mother to nurse her child.

"Babies do not want silks and satins; but they do want sunlight and sanitation.

"A baby wants warmth, cleanliness and comfort. He isn't interested in mahogany or in polished brass."

✻

Boston Association for the Relief and Control of Tuberculosis.—The twelfth annual report of this organization is an interesting example of what aid such a private association can be to the health department in combating this dread disease. The association was organized in 1903 and since then has been doing excellent work in many directions. Illustrative of this is the fact that the association

1. Has helped in reducing the death-rate from tuberculosis in Boston from 23 + per 10,000 inhabitants in 1903 to 17 + in 1914.

2. Supported a nurse to examine and report on the home conditions of cases of consumption, and to give advice and instruction to patients and their families, both at home and at the State Sanatorium examining clinic.

3. Founded and operated for three seasons, under a special fund, the first American Day Camp Sanatorium for Consumptives.

4. Instituted a special investigation and physical examination of children in the families of those who have tuberculosis.

5. Maintains traveling educational exhibits, illustrating methods of prevention and cure of

the disease, and the importance of cleanness to the general health.

6. Presented to the Legislature of 1911 six bills, four of which became laws.

7. Has organized a special committee on Health in Industry with a paid secretary. This committee interests mercantile and manufacturing concerns in the conservation of the health of employees.

8. Supported a Domestic Science Visitor to instruct families afflicted with tuberculosis in the proper selection and preparation of food.

9. Has issued "Friendly Advice for Consumptives" (English, French, Italian, and Yiddish), "A War upon Consumption," "Protection of Health from Tuberculosis" (English and Italian), "Out-door Schools," and other circulars for popular distribution.

Public Health Notes.

The Conquest of Typhus Fever.—The splendid work of the American Commission under Dr. R. P. Strong in stamping out typhus fever in Serbia is the subject for editorial comment in *American Medicine* for February 1916.

"From the time of the plague in Athens in the fifth century B. C., it has ravaged many lands and influenced the destiny of nations. Particularly has it been the ally of Mars and fought along with powder and shot for the desolation of mankind and the ruination of states."

The writer then goes on to trace the history of the disease down to the isolation of the organism in 1915 by Plotz, and the important part played by American investigators.

"The entire story of prevention of typhus fever may be summed up as the maintenance of cleanliness. Plenty of water and soap, the disinfection of clothing, the application of kerosene oil together with general sanitation will not merely clear up an epidemic of typhus fever, but will prevent its occurrence.

* * * * *

"The main lesson learned from the activities of the United States Commission in Serbia is that the war against typhus fever is reduced to a problem in economic entomology. As the antiplague campaign has resulted in a fight against rodents and their accompanying fleas, so typhus prevention has been concentrated in the elimination of the pediculus vestimenti and pediculus capitis."

*

Intensive Community Health Work.—One frequently meets in public health work people "from Missouri," who must be shown results before they lend their support to the health authorities. This class of people is most frequently won over by intensive community health work. Dr. John A. Ferrell, writing in the *Southern Medical Journal*, March, points out that this intensive work affords an opportunity "to go out and definitely prove to the satisfaction of the average man the claims for preventive medicine that have been made by the health officer and his assistants in pamphlets, newspaper articles, addresses, etc. It establishes interest and confidence in the lay mind, which results in the local appropriation of funds for extending intensive community health work.

"Intensive community health work differs from ordinary health work, in that a concrete health problem is taken and adhered to until measurable progress has been made. It is limited to a relatively small circumscribed area or areas instead of being diffused throughout a large area such as a state or a county. A detailed record or a survey is made of the area selected, including every house, school, church, road and stream, and usually, this information is shown on a map. Every home is visited and inspected and every person is examined as far as practicable with reference to the particular health problem under consideration."

He describes the work conducted by six of the states in the South and directed to the prevention and cure of hookworm disease and concludes that this community system is "practicable, that it brings definite and convincing results, and that its cost is not beyond the means of the people. It thus affords an opportunity to advance public health work on the basis of concrete demonstrations just as farming has been revolutionized by the concrete demonstration."

A New Type of Open Air School.—The *London Medical Officer* for March 4, 1916, offers an interesting solution of the very difficult problem of open air school architecture. This plan is by G. H. Widdows, and illustrates some new departures in heating, lighting, and ventilation. The plan has been tried out during the winter months and the notes are based on actual results.

"The special lighting of this school is by means of a skylight the whole length of the classrooms and 5 feet deep, inclined at an angle of 60 degrees with the horizontal. The light received through this skylight is evenly distributed and full, and, coming from above the level of the eyes, gives to the classroom a very restful appearance.

"The heating was a new departure, suggested by the school medical officer, and consists of low-pressure steam pipes in trenches under a concrete floor. It was the subject of thought for two years. It has been found that the floor surface need not be more than 75° F. This temperature is not sufficient to cause inconvenience to the feet. With an outside temperature of 38° F. with the top half of the door down on one side and the hoppers open on the other, it has been found that a floor temperature of 79° F. gives a temperature of 59° F. 1 foot from the floor, and 57° 6 feet from the floor. The great feature of the floor heating is the uniformity of temperature obtained whatever the outside temperature.

"As regards ventilation, this school is far in advance of anything so far attempted in this country. The two sides consist of folding doors opening out under covered verandahs. It is therefore possible to have one or both sides open; not only so, but the doors are made so that the top half drops down, and half one or both sides can be open. Should wind and weather be very unpropitious the top halves of the doors can be made to fall open a distance of 4 inches and act as hoppers. It will thus be seen that it is possible on both sides to have the doors wide open, half open, or partly open as hoppers."

*

The Standardization of Disinfectants.—An elaborate and critical comparison of the Hygienic Laboratory and the Rideal-Walker tests, by J. T. Ainslie Walker, appears in the New York *Medical Journal* for March 11, 1916. This is doubly interesting in view of the fact that the European conflict has aroused widespread interest in the subject of disinfection and the prime need of determining the germicidal efficiency of disinfectants.

Six elements are enumerated which the author believes should be found in a reliable test for the standardization of disinfectants. Each of these is discussed in great detail and the following defects in the Hygienic Laboratory method pointed out:

"1, The variable phenol control; 2, the inconsistent resistance of the test organism; 3, the use of an arbitrary mean between two abnormal extremes for ascertaining a fictitious coefficient; 4, the complicated technic; 5, the open pots which preclude thorough mixing and also permit contamination; 6, the impossibility of obtaining concordant results by different workers."

From the foregoing he concludes that "instead of being an improvement upon the standard Rideal-Walker test, the so-called hygienic laboratory method is so defective as to be wholly unreliable and incapable of furnishing results of any scientific or practical value whatever."

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Relative Prevalence of Tuberculosis Under Good and Bad Housing Conditions.—There is food for thought in the article on this vital question in the March number of the *Journal of the Outdoor Life* by Dr. Charles J. Hastings, Health Officer, Toronto, Ont. He reminds us that:

"In considering the problem of greater prevalence of tuberculosis under bad housing conditions, we have to deal in many cases with cause and effect. Whether disease, by adding to the family expenditure and by diminishing the wage-earning power, leaves less money available for rent and thus brings about the overcrowding; or whether, on the other hand, overcrowding is associated with some other conditions or conditions which are favorable to disease, are questions of vital importance in this connection.

"We naturally ask ourselves then, how much of the misery in our back streets is due to one thing and how much to another? How much is due to worry? How much to dark, dusty factories? How much to improper clothing? How much to improper, insufficient, or badly cooked food? How much to general malnutrition?

How much to overcrowding? How much to unsanitary privy pits? How much to drunkenness and dissipation?

"In the report made by the Social Survey of the Cincinnati Anti-Tuberculosis League, the conclusion arrived at was that dissipation must take the lead as the causes of increased tuberculosis in these districts.

"Have we not taken too much for granted in the deductions we have made in the past in our investigations, and has not the time now come in the march of social progress when we must be more specific and debit to the various items of our list of social ills, the proportion of maladjustment due to each?

"While I do not wish for a moment to underestimate the significance of good housing conditions, yet I wish strongly to urge the necessity of a more careful analysis of the various causes of the greater prevalence of tuberculosis under bad housing conditions."

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Community Sickness Surveys.—An interesting report on this new effort in Public Health work appears in the *U. S. Public Health Reports* for February 26, 1916. The investigation was carried on by Lee K. Frankel, Ph. D., sixth vice-president, and Louis I. Dublin, Ph. D., statistician, Metropolitan Life Insurance Co., New York. The work was prompted by the fact that:

"An unemployment survey made by the Metropolitan Life Insurance Co. in conjunction with the Bureau of Labor Statistics of the Federal Government, during 1915, and covering over a million wage-earners in selected cities of the United States, developed the interesting fact that 11 per cent. of the unemployment was caused by sickness or accident disability. Over 1 per cent. (1.2) of all the wage-earners canvassed were unemployed on account of illness. The figure varied somewhat from city to city. The maximum was in Duluth, where 2.4 per cent. of all wage-earners were unemployed because of illness; the minimum was in Milwaukee, where 0.8 per cent. were so unemployed.

"These facts, together with a desire to measure approximately the amount of illness prevailing in American communities, have led the executives of the Metropolitan Life Insurance Co. to institute a plan to determine the amount of sickness, similar to that utilized in surveying unemployment. As in the latter investigation, the company availed itself of the services of its field organization, and the city of Rochester was chosen as the community in which the initial survey was to be undertaken."

The problem was attacked from many sides. Extent of disability, sickness by sex and age, duration of sickness, economic loss from sickness, comparison with other communities' enumeration of sickness were each in turn determined.

"Of the persons unable to work, 220, or 27.6 per cent. of the total cases, were confined to bed, that is, either at home or in a hospital. It is interesting to observe that 10.7 per cent. of all the cases were receiving hospital treatment. On the other hand, 441 cases, or 55.2 per cent., were unable to work but were, nevertheless, up and about.

"The rates for total sickness varied sharply by age periods. Among males, the highest rate occurred in the age period 65 and over; the least for the group of ages under 15. The same age periods exhibit the greatest and least amount of sickness for the females. Since our study is concerned essentially with sickness involving incapacity to work, the following observations will apply solely to that class of cases. The rates of sickness among females incurring disability were distinctly higher than for males for all ages up to 54. From age 55 onward the male sickness rate exceeds that of the females.

"The durations of the several illnesses to the date of inquiry were also ascertained. Of the 661 persons unable to work, 8 were incapacitated one day, 41, or 6.2 per cent. were incapacitated less than one week. Among those sick and unable to work, 149, or 22.5 per cent., were incapacitated less than one month. On the other hand, persons able to work showed a smaller proportion of the cases under one month in duration. Rheumatism, neuralgia, neuritis, neurasthenia, and headache, which constitute the bulk of the cases sick and unable to work, were for the most part longer than one month in duration, and therefore influence the figures for the entire group. A considerable number of the cases were of long duration; thus, 128, or 19.4 per cent., were between one year and three years. Of the cases with disability, 177 cases, or 26.8 per cent., lasted over three years.

"The duration of the illnesses of those sick but able to work was chiefly for long periods. Seventy-eight out of 137 cases of sickness not involving incapacity to work, or 56.9 per cent., were one year or more in length.

"Rheumatism, diseases of the nervous system, organic diseases of the heart, and Bright's disease were responsible for a large part of illnesses over one year for those sick but able to work.

"The estimated male population of Rochester 15 years of age and over for the year 1915 is 92,552. On the basis of the above sickness rates we may conclude that there are throughout the year at least 2,147 males constantly sick. This means approximately 644,000 days of disability for males alone, for we may count on 300 working days per year per individual. At an average daily wage of $2, the wage loss alone for a year in a city like Rochester would be $1,288,000, and this figure, we have observed, is a minimum. It does not include cost of medical care, drugs, nursing, etc. The number of females in Rochester 15 years of age and over in the same year is estimated to be 93,392, which, at the rate of sickness found, would give 2,400 cases of sickness continuing throughout the year. The economic loss sustained through this disability of the females is doubly difficult to estimate because of the uncertainty of the number engaged in gainful occupations.

"Sickness surveys made in conjunction with the decennial censuses of the federal government should prove most helpful. In like manner, the statistics of hospitals, of visiting nurse associations, and of institutions for the care of the blind, the crippled, and the insane should be collected and analyzed. It is only through the coördination of such sources that the total cost of sickness and accident disability in the community will be ascertained and proper measures organized for its control. The life conservation movement of today, as a basis for a constructive program, has a deep need for a scientific and accurate measure of sickness and of its effects."

The Health Center Idea: A New Development in Public Health Work.—The interesting question, "How shall health services be broadened so as to reach the whole population of the town, ward, city, or street?" is answered by Michael M. Davis in the January number of the *Public Health Nurse Quarterly*. He traces the development of the health center throughout the country, discussing in detail the work at Pittsburgh, Cincinnati, Philadelphia, New York, Cleveland, Dayton, Boston, Buffalo, and many other communities.

"The health center illustrates two fundamental principles, namely, a definite area and population is selected for the field of operation; second, it is aimed to extend the services provided to the whole population.

"The health center idea means doing things for everybody, and doing things together, within a given district. More specifically, it is public health work which involves

1. A population unit, *i. e.*,
   (a) The area and population covered is defined;
   (b) The aim is to reach all the population so far as the health services offered apply.
   (c) The results are measured by the 100 per cent. test, that is, not the number of persons reached effectively, but the proportion of the population which is reached effectively.
2. The coördination of local effort, especially,
   (a) Of the medical and sanitary services within the district;
   (b) Of the nursing services, involving correlation or combination of various nursing specialities;
   (c) Of social services, involving correlation or combination of neighborhood forces, and of the social agencies at work in the neighborhood.
3. A local administrative unit, involving,
   (a) A local administrative head;
   (b) Supervision of all special services by specialists working administratively through the local head."

Industrial Hygiene and Sanitation.

Industrial Medical Supervision.—Large industrial concerns are beginning to adopt medical supervision, both as an economic measure as it affects the employers, and in the interest of the employees. A pamphlet issued by the Eastman Kodak Company contains the address of its medical officer, Dr. Guy L. Howe, to the Rochester Chamber of Commerce. He describes the plan of organization of the medical work and some of the results. The work is divided into physical examination, care of accidents, care of sickness, sanitary inspection and health publicity. Every applicant for work who qualifies, by his own consent, undergoes a physical examination to determine his fitness for the work he expects to do. This examination includes a study of the heart and lungs, a test of the eyes for astigmatism, colorblindness and near and far vision, and a test of the hearing. Teeth, throat and neck are examined and a urinalysis is made. Rupture, flatfoot, varicose veins, hemorrhoids and evidence of communicable diseases are looked for. Vaccination is required in all who have not been successfully vaccinated within fifteen years. Anemia is looked for and blood pressures taken when deemed necessary. As instances of the findings among the 6,000 employees it is said that moderate elevated blood pressure was found in 28, and serious in 42, or 1.1 per cent.; moderate heart disease in 38 and serious in 18, or 0.77 per cent.; ruptures (moderate) in 116 and severe in 39, or 2.57 per cent. Eight patients with tuberculosis are under treatment in sanatoriums or by open air methods at the expense of the company. Poor teeth which should have the attention of the dentist were found in 90 per cent., and in 1,537, or 25 per cent. of all employees, the dental defects were such that failure of treatment amounted to serious neglect. By these methods of examinations carried out periodically, incipient defects are discovered, and they also afford a basis of comparison of the physical status of employees from year to year. Instances are given in which the discovery of serious defects permitted the shifting of men to other work which they could do without injury. Specially defective employees to the number of 281 are examined every six or twelve months, and all dining room employees every three months. In accident cases the services of the company physician are available throughout until recovery, and hospital and consultation fees and the cost of roentgenograms are provided at company expense. This procedure was effective before the enactment of the workmen's compensation law. This law does not require the treatment of sickness among employees, but this constitutes a large part of the work of the medical department. From fifty to a hundred cases of minor illness are said to be taken care of every day. The department acts as a medical clearing house, determining when an employee is fit to remain at work and when he should be in bed. Employees are recommended to employ their family physicians, as determined by two questions: Would the man go to his physician if the department did not treat him, and could he afford to pay the necessary fee? A negative answer to either would determine treatment by the medical department. It is said, however, that ten patients are placed in the hands of the local medical profession to one who is taken away. Sanitary inspection each month has been arranged for in all factories, in dining rooms, workshops, washrooms, lockers, and of drinking water. A monthly health bulletin is distributed to employees, and a health manual has been prepared. —*Jour. A. M. A.*, Feb. 26, 1916.

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Fatigue and Efficiency.—In a current number of *Collier's*, Dr. John B. Huber makes this comment on Fatigue and Efficiency:

"Efficiency decreases as fatigue begins, and it ends far short of exhaustion. Enterprisers find that it pays to alternate judiciously work and rest; to eliminate all unnecessary motions; to guard the worker against molestation or interruption; to have light, ventilation, and other factors agreeable; and to take counsel of the physician, the sanitarian, and the psychologist. There is, in the worker's tired brain, nerves, and muscles, danger not only to himself but to others. The number of accidents increases

progressively during the morning as fatigue comes on; drops after the noon recess; rises hour after hour until the end of the working day. The same obtains with brain work as with muscle work; there is in science really no difference. Bank managers long ago recognized the relation of fatigue to efficiency, and have therefore closed their tellers' windows at three; less expensive this than the mistakes of tired employees. How often has the overwrought dispatcher sent trains into collision! Fatigue, nerve tension, hurry, and worry are perverse and uneconomic factors; and when to these alcoholism is added the human machine—normally the best self-repairing apparatus in the world—is sure to go, most pathetically and all too prematurely, to the scrap heap. Here is what the General Safety Committee of the Raritan (N. J.) Copper Works has noted in its publication, *The Ingot:*

" 'Between eight and nine, the first hour of the shift, is the danger hour as to accidents; also more accidents occur on Monday mornings than at any other time; also on mornings following holidays than on the mornings of other days. To any man that can think in a straight line all this means just one thing. It is a plain fact, and we'll state it plainly: Too much drinking at night means foggy eyes and unsteady nerves next morning. Then the accidents pile up. Now, let's get right down to brass tacks. This is no grape-juice journal. We hold no brief for prohibition. What we are working for is safety. Cut down the booze and, as surely as night follows day, you will cut down the accidents.' "

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The Pace that Kills.—"Doctors have told us often in late years, that our pace is too fast—that we are living not wisely but too well. Insurance companies, from motives that are entirely obvious, are urging reform; lately they have united in an effort to find out precisely what is wrong with our manner of living and to provide a remedy.

"To that end, the Life Extension Bureau of New York, through Dr. Lyman Fisk, medical director, has been making an investigation. A group of 1,000 skilled mechanics was examined and later another group of 1,000 clerks. The object, of course, was to compare the health of men who had active lives with the general health of men whose business is of a sedentary character.

"It was found, according to word from the Doctor, that the mechanics, as a whole, were little, if any, better off than the clerks. The active workers presented fewer cases of heart disease, but more cases of thickened arteries. Bad blood pressure was slightly more prevalent among the clerks than among the factory employees, but the latter showed twice as many cases of kidney trouble as the former. They had more lung impairment, too. More than half the members of the groups were partaking daily of unsuitable diet. Doctor Fisk says further about the results:

" 'I feel justified in asserting that the evidence of widespread premature physical decay, which is suggested by our vital statistics, is to a considerable degree confirmed by actual examination of large groups of supposedly healthy young people. Thousands of people are slowly and inevitably preparing for physical breakdown or premature death, and there can be no more important work for modern medicine than to bring such cases, as early as possible under proper hygienic or medical guidance.'

"And, he adds, 'That there is some particular influence at work causing the upward trend in mortality from organic diseases, seems probable. It may be found in our rapid industrial and social evolution, bringing about a condition of widespread prosperity and lavish expenditure—this relatively extending to the comparatively small wage-earner in the factory.'

"This is not saying much that is helpful. It is too vague to be of appreciable service. But it does prescribe simpler and more rational living, and that surely is a medicine worth trying."—*The Dodge Idea*, March, 1916.

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Fitting Men Instead of Firing Them.—"When a man finds that the sleeves of his new coat are a trifle too long he may do one of two things—buy a new coat or have the sleeves shortened. There is little doubt that he would choose the latter. Yet until recently, if a workman in a factory failed in some small particular, he was promptly discharged and replaced with a new one. It is coming to be recognized, in the modern program of handling men, that in many cases fitting an unsatisfactory man to his job

is cheaper and better than firing him. This means that the boss who is skilful in handling his men—always an asset in any business—is today an imperative necessity. If we are to 'fit' instead of 'fire,' we must have expert fitters—men to know how the fitting can best be done, whether by instruction, argument, reproof, or simply by 'watchful waiting.' Says the writer of a leading article in *Factory* (Chicago, March):

" 'Employers are coming to realize that, even if no other motive were involved, it costs money to break in new workers. More attention than ever before is being paid to the hiring of men, in order to secure those adapted to the work, that the waste of misfits may be avoided. Similarly, 'firing' is not the light affair that it was once supposed to be.

" 'Modern efficiency believes in curing faults, if possible; in teaching those who are teachable; in transferring from one kind of work to another until the round peg fits the round hole. 'Firing' is regarded as a last resort, reserved for certain flagrant sins, or incompetence that has persisted through numerous opportunities.

" 'This means that more attention than before is being given to the personal side of industrial discipline. . . .

" 'The economic advantage of the new method is easy to recognize, if not to figure in dollars and cents. In general, it may be said that the new type of discipline is based on the 'rule of reason' to a greater extent than in any previous system. Once military discipline, with no explanations and no room for questions, was favored. If the individual did not give his best work under this system, that was supposed to be the individual's loss. The loss in shop-efficiency was not considered.

" 'There are workers who still prefer that form; they have no desire to reason why; theirs but to do or—be fired. As a rule, they are the ones who like to avoid responsibility. Suggestions for improved methods are not likely to come from them.

" 'The best worker is pretty certain to be the one who appreciates a knowledge of the reasons for any deviation from routine-methods. A straight appeal to reason may even correct a fault that could be made to yield in no other way. But it must be a reason that in the mind of the worker is not trivial, and one that comes within the range of his own point of view. . . .

" 'It makes little difference in what department of work a principle of management be found; it can be adapted to any other where similar conditions of humanity prevail. For men are much the same, whether employed in factory or in office, and the appeal which moves one will almost inevitably move the other.

" 'Perhaps the most common of faults among workers is the lack of ambition. This may show itself in many ways, but always the trouble resolves itself into a fundamental lack of interest in the work. The new science of management has absolutely reversed the old practise in dealing with this failing.' "—*Literary Digest*, April 1.

Physical Examination of Employees.—In a recent issue of *Safety Engineering* there appears an interesting review by Dr. W. H. Clarke of the Norton Grinding Company of Worcester, of his work at that establishment. With reference to the physical examination of employees, Doctor Clarke makes this statement:

How Thorough Should a Physical Examination Be?

"At Norton Company we find ourselves becoming more and more thorough as time goes on. Each addition to our routine has been made because of necessity and not for theoretical reasons. We now make an examination which takes from 12 to 20 minutes and which includes blood pressure but not urinalysis except in cases of 40 years or over, and in younger individuals when indicated by blood pressure of 150 systolic. Otherwise the examination is about as complete as for life insurance. The patient is completely stripped before it is concluded. We have never had any trouble from men in accepting this examination as a preliminary to being hired. In fact, the majority of men show great interest and thank the doctor for the advice which he gives them in regard to minor defects.

"It has been stated by physicians at different meetings that a complete physical examination should take at least an hour. We are willing to admit that from 12 to 20 minutes is an extremely short time in which to make a complete physical examination, but unless this short time is taken, physical examination of employees in factories

would be impossible without such a large staff of nurses and doctors that the expense would be prohibitive.

"In my work I hear a great deal from the manufacturing side. I find that the enthusiasm of the board of directors is not great toward spending large sums of money for physical examinations and it is very easy to frighten prospective adopters of this system by unnecessarily strict examinations.

"During my experience at Norton Company we have found practically no cases in which our primary physical examination proved later to have been inadequate. And such lapses, when they occur, are rapidly corrected as a result of subsequent treatment."

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Large Percentage of Sickness.—The responsibility for sickness as a cause of dependency is shown by an investigation conducted by Miss Mary VanVleck of New York for the Russell Sage Foundation.

"The investigation of sickness among wage-earners is still in progress, but certain results have been obtained for the information of those interested in health insurance. From the records, supplemented when necessary by personal interviews, we learned facts about family conditions, industrial history, and environment, losses suffered through illness, the aid given by the community in relief and in care for the sick, unhealthy factors present in the occupation or in home life—in short, the real histories of families in whose misfortunes sickness has played a part in an application for relief or in the course of treatment by the Society. We kept before our minds the question, how frequently is sickness encountered as a factor in dependence?

"A preliminary study of the records of more than 6,000 cases under treatment in a single year in the Charity Organization Society showed that in 37 per cent. the sickness of wage-earners was a factor in the need for aid. In the United Hebrew Charities, the statistician reports 34 per cent. This does not mean that sickness was the sole cause of dependence, but rather that it was a condition found in a very large group of families. It is necessarily an inadequate statement, however, for it does not show that in many families now under care because of family problems other than illness, the past history might reveal that sickness of a wage-earner was the first step toward dependence, bringing in its train many other causes of incapacity for self-maintenance.

"Under existing conditions the medical care which these wage-earners could command for themselves often was meagre. Of the 700 wage-earners we studied, we found that only 174 had made use of private physicians. The majority had gone from one hospital or dispensary to another.

Low-Paid Branches of Labor.

"Most of the families studied belonged to low-grade branches of labor. The fact that they belonged to the lower ranks of labor is often accounted for by deterioration following illnesses in the past. We found that nearly 400 of the families had appealed to friends and relatives for help. These friends belonged to a class which could ill afford to give such help, and to do so must have imperilled their own health and strength. Every kind of device to raise the income needed in the different distressed households had been tried. The wives had gone out to work; money had been borrowed, lodgers taken in, and even the children had been sent away from home to state institutions.

"In two-thirds of the cases studied, illness had lasted more than half a year at the time of investigation. Not only was it distressing to contemplate the long period over which these illnesses had extended in the past, but a physician who examined these records to find, as far as possible, the probable date of restoration to health reported a very high rate of chronic disorders.

Much Permanent Sickness.

"Of the 687 cases studied in this way, the physician estimated 295 as chronic, while 81 were likely to become progressively worse. While these figures cannot be accepted as indisputably accurate, they go to show that among the class of people studied the rate of permanent illnesses is very high. Moreover, it is not unsafe to say that more prompt medical care might have prevented such prolonged suffering, and that upon the medical institutions of the community must devolve the task of giving such prompt and adequate treatment as to guard against the hopelessness characteristic of so

many of the families cared for much later by the charitable societies.

"We can strike an effective blow at poverty by preventing sickness. The health insurance plan puts a cash value on the good health of the worker for the employers, the workers, and the taxpayers.

"The need is for an equitable distribution of the burdens of a common misfortune, for education in hygiene, for an extension of the activities of state and city departments of health, for opportunity for thorough periodical medical examination to prevent sickness, for larger resources for effective work in hospitals and dispensaries, for better correlation of all medical agencies, and for increasingly effective control of unhealthful conditions both in homes and places of employment. The subject is large and complicated, and certainly worthy of a state commission to make a thorough study of the facts, as a basis for a well-organized programme of action."

Communications.

ANNOUNCEMENT.

The Journal desires to call the attention of its readers to the establishment of a new section devoted to "Communications." Readers are invited to address such communications to the Editor. Letters for publication should necessarily be of general interest and deal with some public health subject.

EDITOR, AMERICAN JOURNAL OF PUBLIC HEALTH.
755 Boylston St., Boston, Mass.

Dear Sir—The two articles in your March, 1916, issue, "The Control of Scarlet Fever," by A. J. Chesly, M. D., and "Is the Control of Measles and Whooping Cough Practicable?" by Francis George Curtis, M. D., bring up certain points in the practical control of contagious diseases which have been much neglected in the past. Doctor Curtis's article makes a plea for the more intelligent control of measles and whooping cough, and, while admitting the difficulties which stand in the way of practical control, calls for the abandonment of the *laissez faire* policy which has been much adopted on the one hand, and the method of strict isolation on the other hand.

I have already shown (*Jour. Inf. Dis.*, Nov. 1915) a practical method for the control of measles. Doctor Chesly presents a rather elaborate system for the study of scarlet fever out-breaks, by the collection and study of epidemiological data, and shows how this may be modified to adapt it for the prevention of epidemics, as well as for control when an epidemic is once started.

Both of these papers are valuable in calling attention to the need of the control of these diseases by intelligent and effective methods. But no matter what methods are proved in practice to be successful, they will fail unless administered by full-time health officers with adequate technical training. It is well nigh useless to expect the average practitioner-health officer, who gives but a small part of his time to public health work, to become proficient in such methods, or to apply them in actual practice. The great need in public work is the full-time properly trained health officer; having him, a community may expect that intelligent methods for the prevention of disease will be put into effect.

Respectfully yours,
HAROLD F. GRAY.
Health Officer,
Palo Alto, California.

Legal Decisions.

Legal Journal Discusses the Working Man's "Inalienable Right to Rest."—A recent decision of the Supreme Judicial Court of Massachusetts is made the occasion for an interesting and thoughtful article in the Harvard *Law Review* by Prof. Felix Frankfurter, Professor of Law, Harvard. This case invalidates the Massachusetts Statute limiting the hours of work for certain railroad station employees to nine hours per day in ten hours. The Supreme Court held this statute to be invalid because it "Is an unwarrantable interference with individual liberty and an interference with property rights and these are contrary to the Constitutions which secure these fundamental rights." The article discusses and reviews a long line of decisions based on the constitutionality of various statutes fixing and limiting hours of labor (a) For women and children. (b) In admittedly dangerous occupations. (c) In general. It appears that the general run of decisions uphold this type of statute in classes a and b. The weight of authority in class c, however, would seem to be against the validity of statutes like the one in question. Professor Frankfurter points out that every case of this type must be considered as an individual case and should not be decided on a basis of mere theoretical economics and legislation. The fact is that we are coming to realize more and more adequately the relationship between health and work. The argument, based on the Fourteenth Amendment, which is, of course, at the bottom of all the decisions adverse to statutes of this sort is a much vaunted right of the individual to contract for the sale of his labor without restriction. Mr. Frankfurter cites a case where the court calls attention to the fact that it is usually the employer who complains because the workman's right is thus being infringed and that the workman himself is not observed to be exercised over the restriction that is placed upon his right to sell his liberty. This court further remarks that the right to rest may some day come to be considered quite as much one of the inalienable rights granted to the individual under the Constitution of the United States.

This article while it is, of course, primarily a technical legal discussion, is of interest to those engaged in the work of public health on account of the manner in which it reviews the judicial attitude towards the health and social legislation which is becoming a larger and larger item in our increasing body of statute law in its process of evolution.

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Harrison Anti-Narcotic Law—Records to Be Kept by Physicians—Section 2 Construed: *United States v. Charter, 227 Fed. Rep. 331.*—"Defendant is indicted under this portion of section 2:

"'Every person who shall give an order as herein provided to any other person for any of the aforesaid drugs shall, at or before the time of giving such order, make or cause to be made a duplicate thereof on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue, and in case of the acceptance of such order, shall preserve such duplicate for said period of two years in such a way as to be readily accessible to inspection by the officers, agents, employees, and officials hereinbefore mentioned. Nothing contained in this section shall apply—

"'(a) To the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this act in the course of his professional practice only: *Provided*, That such physician, dentist, or veterinary surgeon shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date, and the name and address of the patient to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed to a patient upon whom such physician, dentist, or veterinary surgeon shall personally attend; and such record shall be kept for a period of two years from the date of dispensing or distributing such drugs, subject to inspection, as provided in this act.'

"'It is charged in the indictment in each count that the defendant gave an order to a certain person for one of the prohibited drugs; that he failed to preserve a duplicate of the order for two years, as provided; and that he failed to keep a record of the amount of the drug by him then and there dispensed and distributed."

The defendant pleaded not guilty and requested leave to withdraw his plea and file first a motion to quash and, in case the motion should be overruled, a demurrer.

The motion and demurrer are both to the point that the act violates certain provisions of the Constitution the most interesting in the present connection being that it is an act actually designed to regulate the use of certain drugs, but is masquerading as one purporting to raise revenue; that it is not uniform in its character, but is intended to affect a special class of persons only, namely, physicians, dentists, veterinarians, and druggists.

The court says: "The indiscriminate and unrestrained use of opium, coca, and their derivatives is well known to be a great evil, gravely affecting the general welfare of the country. These are exclusively foreign products, and it is entirely within the power of Congress, in the interest of the general welfare, to exclude their importation entirely, or to so regulate the traffic in them in this country that their importations may be traced. A careful study of the act shows that the various provisions for registration, recording, etc., are effective in the tracing of the origin of a drug derived from these foreign products, to the end that infractions of the revenue laws may be ascertained."

Personal Notes

The prize of $1,000 given by the Metropolitan Life Insurance Company through the American Social Hygiene Association for the best pamphlet on Social Hygiene for Boys and Girls has been awarded to Dr. and Mrs. Donald B. Armstrong of Stapleton, Staten Island. Doctor Armstrong is the director of the Social Welfare Department of the New York Association for Improving the Condition of the Poor, and Mrs. Armstrong is actively interested in social and philanthropic work.

The prize was offered in order to encourage a satisfactory treatment of the problems of sex and reproduction for use in the instruction of adolescents. The general quality of the whole group was surprisingly good and it is a noteworthy fact, especially in view of the subject-matter of the competition, that there were submitted almost no freak or sensational productions. The winning manuscript will be published in the next issue of the American Social Hygiene Association's quarterly together with an account of the contest.

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Edward A. Moree, assistant secretary of the New York State Charities Aid Association, has been appointed director of the Atlantic Division of the Red Cross with headquarters in New York City. The division includes 21 states east and south of the Ohio River and east of the Mississippi. Mr. Moree will have charge of emergency relief work in disasters and with the forming of new Red Cross chapters in the campaign for a million members. In addition to a wide range of duties for the State Charities Aid Association, he has been secretary of the commission which investigated the public health situation in New York and drafted the new state health code. He is now advisory expert in public health education in the State Department of Health.

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Dr. John T. Leavitt, city health officer of Camden, N. J., has been appointed chief of the medical staff of the Municipal Hospital for Contagious Diseases, which will be opened in Camden during the week of May 18.

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Dr. C. V. Craster has been appointed health officer of Newark, N. J.

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The following persons were elected to membership in the American Public Health Association:

Charles Carter, Parsons College, Fairfield, Iowa, Professor of Biology.

Raymond J. Cary, Mt. View Sanatorium, Lake View, Wash., Physician.

William Lee Hart, Madison Barracks, N. Y., Captain Medical Corps.

Theodore C. Merrill, Washington, D. C., Physician.

Bessie E. Ammerman, New York City, Superintendent of Nurses, Henry Street Settlement.

Dr. Filberto Rivero, Havana, Cuba, General Inspector, Health Department.

Samuel M. Schmidt, Boston, Mass., Health Inspector.

Henry L. B. Coote, Michigan City, Ind., Veterinarian.

Charles M. Talbert, St. Louis, Mo., Civil Engineer.

Miss Myrtle E. King, Minneapolis, Minn., Registrar of Vital Statistics.

Harry J. Krum, Allentown, Pa., City Chemist and Bacteriologist.

Philip W. Engel, Chicago, Ill., Vice-President, International Filter Company.

Sol Pincus, Hygienic Laboratory, Washington, D. C., Sanitary Engineer.

William W. Smith, Portsmouth, Ohio, Physician.

Enos S. Spindel, Springfield, Ill., Physician.

Carl Ziegler, Cincinnati, Ohio, Director Physical Education, Public Schools.

George D. Lummis, Middletown, Ohio, Physician and Health Officer.

Dana E. Robinson, New York, U. S. Public Service, Ellis Island.

Ed. J. Schwartz, M. D., Salem, Ohio, Health Officer.

Edward M. Van Cleve, New York, Managing Director, National Commission for Prevention of Blindness.

*

Dr. Milton J. Rosenau, director of the School for Health Officers, Harvard University and the Massachusetts Institute of Technology, has been appointed to give the Harrington Lectures at the University of Buffalo Medical School on May 30, 31 and June 1, 1916. Two lectures will be given on "Anaphylaxis" and the third will be on "Education for Public Health Service as a Career."

*

Dr. Stanley H. Osborn, a recent graduate of the School for Health Officers, Harvard University and the Massachusetts Institute of Technology, has been appointed district health officer by the Massachusetts State Department of Health.

*

The County and City Board of Health of Tuscaloosa, Ala., has recently appointed Mr. A. F. Allen as assistant health officer. Since his graduation from the Harvard-Technology School for Health Officers, Mr. Allen has been connected with the health work of Waltham, Mass., and with the epidemiological work in Fitchburg, Mass.

*

Dr. H. H. Mitchell has been appointed epidemiologist to the Indiana State Board of Health. Dr. R. W. E. Cole has been reappointed health officer of the town of York, Maine.

Current Public Health Literature.

AMERICAN.

The American City.

March.

The Topeka Public Health Nurses Association. Grace Overmyer.

Motor Trucks for Refuse Collection. S. A. Greeley.

Activated Sludge as a Fertilizer. E. Bartow and W. D. Hatfield.

American Journal of Clinical Medicine, Chicago.

XXIII. March.

Bacillus-coli Cystitis and Its Successful Treatment. J. F. Biehn.

Vaccine and Serum Therapy in Everyday Practice. W. C. Wolverton.

April.

The Therapeutic Indications Suggested by Routine Blood Examination. B. G. R. Williams.

Vaccine and Serum-Therapy in Everyday Practice. Part III. W. C. Wolverton.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans.

III. March.

Medical Notes on Jamaica. J. F. Siler.

Deep Sea Diving and Its Relation to Caisson Disease. C. H. Halliday.

Boston Medical and Surgical Journal.

L. March 9.

Field Work of the State Department of Health on Communicable Disease. William W. Walcott.

Engineering News.

LXXIII. March 11.

City Planning on an Exceptionally Large Scale is Meeting with Public Approval at Philadelphia.

March 18.

Subway Air Exceeds Health Boards Standards, Ventilating Experts Find.

March 25.

Cleveland's Sewage Treated by Revolving Screens and Novel Grit Chambers. George B. Gascoigne.

Interstate Medical Journal, St. Louis.

XXIII. March.

Therapeutic Measures for Pulmonary Tuberculosis Suggested during 1915. E. N. Packard, Jr.

The Immigrants in America Review, New York.

I, No. 4. January.

Sanitary Preparedness—The Need of a Uniform and Efficient Quarantine Service. E. H. Lewinski-Corwin.

A Social Coöperative Movement. Alexander Fleisher.

Journal of the American Medical Association, Chicago.

LXVI. February 26.

Present Views in Respect to Modes and Periods of Infection in Tuberculosis. M. P. Ravenel.
Diphtheria Carriers. Guger, Kelly, and Bathgate.
Cultural Experiments with Spirochaeta Pallida. Wile and Kruif.
Sanitation and the Control of Pellagra. C. T. Nesbitt.

March 4.

State Health Organizations. C. V. Chapin.
Some Essentials to the Development of Efficient Health Organizations. J. W. Kerr.
Hay-Fever: Its Cause and Prevention. W. Scheppegrell.
Pollen Extracts and Vaccines in Hay-Fever. Strousse and Frank.

March 11.

The Treatment of Diphtheria Carriers with Iodized Phenol. Ott and Roy.
The Follow-Up System of the Presbyterian Hospital in New York City. J. A. Corscaden.
The Control of Diphtheria Epidemics. W. D. Stovall.
The City's Need of a Psychopathic Clinic. Stewart Paton.

March 25.

Diphtheria in Manila. A. P. Goff.
Studies in Diphtheria. II. Ruh, Miller and Perkins.
The Use of Kaolin to Remove Diphtheria Bacilli from the Nose and Throat: Further Observations. B. Rappaport.
Vaccines of Favus and Ringworm. C. H. Lavinder.
Foot-and-Mouth Disease in Man. Sutton and O'Donnell.

Journal of the American Water Works Association, Baltimore.

III, No. 1. March.

Variation in Precipitation as Affecting Water Works Engineering. C. P. Birkinbine.
Effect of Solutions of Filter Alum on Brass Pipe Fittings. G. R. Spaulding.
Filter Operation. Tolson and Van Loan.
Iron Removal by Rapid Sand Filtration. F. E. Hale.
Water Softening Practice. S. A. Greeley.
The Development of Rapid Sand Filters in Ohio. Philip Burgess.
Sources of Water Pollution. J. W. Hill.
Methods of Sending Specimens of Water. J. J. Hinman, Jr.
The Relationship of the Epidemiologist to Water Works Men. Mark F. Boyd.
Experiments in Water Softening with a Zeolite-like Substance. R. N. Kinnaird.

Journal of Laboratory and Clinical Medicine, St. Louis.

I. March.

Observations on Typhoid Fever in Detroit. H. F. Vaughan.
Immunity in Tuberculosis. G. B. Webb.

Journal of Outdoor Life.

XIII. March.

Tuberculosis and Bad Housing. Mrs. A. F. Bacon.
House Infection: A Potent Source of Tuberculosis. I. W. Brewer.
Relative Prevalence of Tuberculosis under Good and Bad Housing Conditions. Charles J. Hastings.

Medical Times, New York.

XLIV. March.

A Study of House Dust. J. W. Redway.
Progress in Public Health During 1915. L. R. Williams.
Jurisprudence of the Alcohol Problem. Andrew Wilson.

Modern Hospital, St. Louis.

VI. March.

The Hospital Laboratory—Its Purposes and Methods. R. M. Pearce.
Compulsory Health Insurance for Every Individual. Olga S. Halsey.
Social Hygiene Department. Progress 1900-1915. William F. Snow.

New York Medical Journal.

CIII. March 4.

Recovery of Streptococcus Viridens from New York Street Dust. William C. Thro.
Poisonous Proteins. Victor C. Vaughan.

March 11.

The Standardization of Disinfectants. T. Ainslie Walker.

March 18.

Therapy as Related to the Immunology of Tuberculosis.

March 25.

The Prevention of Fire in Old Buildings Housing the Insane. J. Allen Jackson.

New York State Journal of Medicine.

XVI. March.

The Schick Reaction and Its Applications. A. Zingher.
Hereditary Syphilis in Children. L. E. La Fetra.
Hereditary Syphilis. LeG. Kerr.
Some Remote Causes of Bad Feeding. F. von der Bogert.

The Nurse, Jamestown, N. Y.

March.

Influenza—Its Prevention and Treatment. L. Neuwelt.
The Rôle of the Visiting Nurse IV. The Nurse in School. Stella Fuller.
The Dental Nurse. A New Profession for Women. A M. Nodine.

Public Health Journal, Toronto

VII. March.

Rural Sanitation. A. C. Jost.
Bacteriology and Specific Treatment of Lobar Pneumonia. Rufus Cole.
Medical Inspection of Rural Schools. S. A. Fulton.
Some Pressing Problems of Modern Times. Sir Thomas Oliver.
Tuberculosis in the Public Schools of Toronto. F. S. Minns.

Social Hygiene.

II, No. 2. April.

Obstacles to Vice Repression. Frederick H. Whitin.
The Educational Attack on the Problems of Social Hygiene. Maurice A. Bigelow.
The Sex Taboo. Hugh A. Moran.
The Psychological Influence upon Adolescent Girls of the Knowledge of Prostitution and Venereal Disease. Miriam C. Gould.
The In-Patient Hospital in the Study and Control of Syphilis. John H. Stokes.
International Agreements in Relation to the Suppression of Vice. James Bronson Reynolds.
Social Hygiene Legislation in 1915.

Southern Medical Journal, Birmingham.

IX. March.

Critical Study of the Wasserman and Luetin Tests Done Simultaneously on 500 Cases. H. L. McNeil.
Intensive Community Health Work. John A. Ferrill.
Rural Sanitation in the South. J. Howell Way.
Sanitating a Rural Home. R. N. Whitfield.
A Plea for the Conservation of Health. Harry J. Mustard.

United States Public Health Reports.

XXXI. March 3.

Rocky Mountain Spotted Fever. L. D. Fricks.

March 10.

Demonstrations of Malarial Control. R. H. von Ezdorf.

March 17.

Death Rates of the Colored Population. John W. Trask.

March 24.

Competent Health Officers. W. C. Rucker.
Occupational Intoxications. Martin I. Wilbert.
Anopheles Crucians. M. Bruin Mitzmain.

FOREIGN.

GREAT BRITAIN.

Journal of the Royal Sanitary Institute, London.

XXXVII. March.

An Outbreak of Food Poisoning. W. Angus.
The Construction of the Royal Military Camp Sewage—Disposal Works at Ripon. Arthur W. Smith.
Defective Lighting and Ventilation in Blocks of Flats. Charles Porter.

Journal of State Medicine, London.

XXIV, No. 3. February.

Water Supply on the March. C. H. Melville.
Physical Deterioration in its Relation to the Industrial Classes. Harry J. Wilson.
Coli-like Microbes in Water as an Index of Sewage Contamination. T. Zammit and F. Riazo Marich.
Some Points in the Causation of Occupational Dermatitis. Frederick Gardner.
Fifteenth Annual Report of the Canadian Association for the Prevention of Tuberculosis. 1915.

Medical Officer, London.

February 19.

Immunity: Natural and Acquired. J. Foster Palmer.
The Ground Level Latrine. Francis E. Fremantle.

February 26.

Doctor Newsholme's Report for 1914–1915.

March 4.

A New Type of Open Air School. G. H. Widdows.

March 11.

An Epitome of Recent Literature in Bacteriology, Protozoology, etc. Alexander G. R. Foulerton.
Standard of Purity of Food Supplies in War Time, and the Utilization of Condemned Stores. J. Wright Mason.

FRANCE.

Paris Medical.

VI. January 15.

The War and Tuberculosis. Landouzy.
Prophylaxis of Tuberculosis during the War. Rénon.

January 22.

The Destruction of Rats in the Trenches. Loir and Legangneux.
Importance of Alcoholism as a Factor in Typhoid Mortality. Labbé.

February 19.

Vaccination at Any Age. Perrin.

Press Médicale.

XXIV. January 10.

Measures to Arrest the Spread of Venereal Disease. Balzer.

January 17.

Charts Showing the Decline of Typhoid Fever since Vaccination. Labbé.

February 10.

Triple Vaccination against Typhoid and Paratyphoid. Widal and Courmont.
Malignant Measles. Longin and Camuset.

GERMAN EMPIRE.

Deutsche medizinische Wochenschrift.

XLII. January 6.

Canned Culture Mediums. Dold.
Simplified Technic for Bacteriological Research. Brauer.
Compulsory Hospital Treatment as Penalty for Exposing Others to Venereal Disease. Blaschko and Ebermayer.

January 13.

Two Weeks Quarantine for Cholera. von Darangi.

February 10.

Simpler and More Rapid Method for Cultivation of Typhoid Bacilli from the Blood. Shūrman.
Organization of the Medical Inspection of Schools in Germany. Süpple.

Medizinische Klinic, Berlin.

XI. December 26.

Technic of and Experiences with Vaccination against Cholera and Typhoid. Biyurd.
Simplified Technic for Counting Bacilli in Sputum. Martin.

XII. January 23.

Well Contaminated with Colon Bacilli as a Cause of Pneumonia. Windrath.

Munchener medizinische Wochenschrift, Munich.

LXIII. January 25.

Official Directions for Prophylaxis of Scarlet Fever. Henkel.

BOOKS RECEIVED.

The Adolescent Period, *by Louis Starr, M. D., LL. D. Philadelphia: P. Blackiston's Son & Co., 1915. Pp. 192. Cloth, $1.00.*

Infant Feeding and Allied Topics, *by Harry Lowenburg, M. D. Philadelphia: F. A. Davis Company, 1916. Pp. 373. 64 Text Engravings, 30 Full-page Plates. Cloth, $3.00.*

The New Chivalry—Health. *Edited by James E. McCulloch. Nashville, Tenn.: Southern Sociological Congress, 1915. Pp. 551. Cloth, $2.00.*

Report on the Medico-Military Aspects of the European War, *by Surgeon A. N. Fauntleroy, U. S. N. Washington, D. C.: Bureau of Medicine and Surgery, Navy Department, 1915. Pp. 140. Many Illustrations.*

A. S. M. C. Year Book—1916. *New York: The American Association of Mechanical Engineers. Pp. 442. Price to non-members, $1.00.*

Painless Childbirth, Eutocia and Nitrous Oxid-Oxygen Analgesia. *By Carl Henry Davis, A. B., M. D., Associate in Obstetrics and Gynecology, Rush Medical College, etc. Chicago: Forbes and Company. 1916. Price, $1.00.*